DOCUMENT RESUME

ED 264 832	IR 011 916

AUTHOR	Baggaley, Jon, Ed.; Sharpe, Joan, Ed.
TITLE	Experimental Research in TV Instruction. Proceedings of an International Conference (2nd, St. John's, Newfoundland, Canada, June 21-23, 1979). [Volume 2.]
SPONS AGENCY	Memorial Univ., St. John's (Newfoundland).; Social Sciences and Humanities Research Council of Canada, Ottawa (Ontario).
PUB DATE	Jun 79
NOTE	159p.; Volumes 1 and 3 are out-of-print. For related documents, see IR 011 917-918.
AVAILABLE FROM	J. Baggaley, Dept. of Education, Concordia University, H549-12, 1455 de Maisonneuve Blvd., Montreal, Quebec, Canada H3G 1M8 ($20.00).
PUB TYPE	Collected Works - Conference Proceedings (021) -- Reports - Research/Technical (143)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Academic Achievement; Audience Analysis; Distance Education; *Educational Television; Foreign Countries; Formative Evaluation; *Instructional Design; Mass Media Effects; Nontraditional Education; Production Techniques; *Programing (Broadcast); Summative Evaluation; *Television Research; Television Viewing; *Videotape Recordings
IDENTIFIERS	Canada; *Instructional Effectiveness; Sweden; West Germany

ABSTRACT

A foreword by Arthur M. Sullivan and an introduction by Jon P. Baggaley introduce the 12 conference papers included in this collection. The papers are as follows: (1) "Research on 'Sesame Street': Designing the Educational Context" (Rodney Dennis); (2) "'Sesame Street' in Labrador" (Graham Skanes and Lorne Taylor); (3) "Videotapes for Correspondence in Economics: First Results at the Fernuniversitat Hagen" (Wolfram Laaser); (4) "Watching Slow Learning Children Watch Television" (Patricia Porter); (5) "Attitudes and Achievement Following Live and Videotaped Instruction" (Arthur M. Sullivan, Emir Andrews, Richard Maddigan, and Cathryn Noseworthy); (6) "Some Experimental Uses of Color Television in Undergraduate Chemical Education" (Everett Nienhouse); (7) "The Effects of Placement, Delivery Format and Missed Cues on TV Presenter Ratings" (Gary Coldevin); (8) "Perceiving Reality via Mass Media" (Olle Findahl); (9) "Can Effectiveness of Televised Instruction Be Improved by Controlling Production Variables?" (P. David Mitchell); (10) "The Formative Evaluation of Instructional Television Programming Using the Program Evaluation Analysis Computer" (Rand Nickerson); (11) "Image Presentation: Some Semiological Issues" (G. Harry Jamieson); and (12) "The Utility of Experimental Research in Videotaped Instruction" (Tony Bates). An overview of the conference by a practitioner's panel (Charlotte O'Dea, Craig McNamara, and Charles Mardel) and a list of participants conclude the proceedings. (JB)

EXPERIMENTAL RESEARCH IN TV INSTRUCTION

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A 3-Day International
Research Conference
JUNE 21-23, 1979
Memorial University
of Newfoundland
St. John's
Newfoundland

Sponsored by
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PROCEEDINGS OF THE
Second International Conference
on
Experimental Research in Televised Instruction

edited by

JON BAGGALEY

with JOAN SHARPE

Memorial University of Newfoundland

June 21-23, 1979

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FOREWORD

This is the second conference on Experimental Research in Videotaped Instruction which has been sponsored by MUN. At the conclusion of the first conference the participants expressed the desire to continue meeting on a regular basis. Accordingly this second conference was arranged for June 21 to 23, 1979 in Corner Brook, Newfoundland.

The Conference included the same basic format as last year's in that a number of well known researchers in the area were asked to make major presentation concerning their work and were given a substantial period of time in which to do so. In addition the conference provided for four new features.

(i) Participants were invited to submit accounts of research and of those submitted, twelve were selected for presestation. Approximately 30 minutes were allocated for each of these presentations;

(ii) A follow-up session was included in order to permit an opportunity for presentation and discussion of results and conclusions from continuing research in major projects which had been described the previous year;

(iii) A practitioners' panel constituted the last session of the Conference. The panel consisted of representatives from the CBC, the Avalon Cablevision Ltd., and from the University ETV Unit;

(iv) A three-day workshop in video production was held in St. John's immediately after the conference. 10 of those who had participated in the conference also attended the workshop. Instruction in the important factors involved in producing a video programme was provided by the staff of the MUN Extension Unit.

All of the innovations proved to be interesting and highly evaluated by the participants and I hope that they will be continued in future conferences.

This year's participants included a wider range of geographic representation and of research undertakings than the first year. All of the participants without exception expressed pleasure and satisfaction with the Conference and a wish that further conferences be held. The third conference is therefore planned for August 25 to 29, 1980 in St. John's.

I wish to thank Mrs. Anne Conway for her help in preparing for and administering the Conference. Much of the credit for the success of the Conference must go to her.

Again I thank the rest of my colleagues at the IRHA and the Extension Service for their help and support: Joan Bown, Charlie Callanan, Bill Campbell, Randy Coffin, Dorothy French, Joan Harris, John Hicks, Paul Noseworthy, Ada O'Reilly, Don Poynter, Joan Sharpe and Nelson Squires.

It is a pleasure to acknowledge the assistance of the Corner Brook City Council, and the Mayor of Corner Brook, Dr. Noel Murphy for their financial assistance and hospitality. As always the staff of the Glynmill Inn were pleasant, helpful, friendly and co-operative.

Again the financial support of the Social Sciences and Humanities Research Council of Canada (SSHRC) is gratefully acknowledged.

Finally, I wish to thank my colleague Jon Baggaley for agreeing to take over editorial duties from me. Jon has also taken responsibility for arranging the 1980 Conference. I am grateful to him and wish him well.

Arthur M. Sullivan, Ph.D.
Director of Extension Service
Memorial University of Newfoundland
September 1980.

INTRODUCTION

The papers that follow represent a broad range of ETV applications - also varying approaches to the problem of its experimental study. To be honest, some papers reflect a very free interpretation of the term "experimental", and describe the early, exploratory stages of projects that might well develop to a more elaborate level of approach in time. It would be brash to suggest that all of the proceedings therefore contain categorical proofs about television's applications in teaching. But - like the Memorial Conferences themselves - they serve to bring together approaches to ETV from enthusiasts working independently in a number of disciplines; and they show us how different research questions are evolving, some faster than others, in different countries.

The contents fall naturally into two sections. The first six papers concern investigations of specific ETV productions or program series. Investigators are either 'summative' (i.e. studies of audience responses to programmes conducted after the completion of programme-making: Skanes & Taylor, Porter, Sullivan, et al); or they are 'formative' (concerning programme research term, of course, all good TV research should be 'formative' in that it should aid in the formation of new and better programme policies; at present, however, some studies are more immediately formative than others - and, as the Sesame Street studies described by Rodney Dennis, these can be readily applied by TV producers in practice. In the papers by Laaser and Nienhouse we learn of basic approaches to televised education which will clearly lend themselves to interesting evaluations henceforward.

With the paper by Coldevin, we enter a new area of the volume, where research techniques and results not specific to particular programmes are discussed. From evidence and/or theory, the worthwhile attempt to generalize about ETV procedures is made (Coldevin, Findahl). New techniques for the investigation of audience reactions in general are described (Mitchell, Nickerson); and new theoretical perspectives for ETV research are discussed (Jamieson).

The Proceedings ends with summaries of the Conference provided from research and production standpoints (Bates, O'Dea et al). Only two of the papers origionally presented at the Conference have not been reproduced here: that by myself, owing to its copious publication elsewhere (see refs. in Coldevin's paper), and that by Sakamoto owing to language problems. Copies of Dr. Sakamoto's paper - on the effects of video feedback in teacher-training - may be sought directly from the author.

I gratefully acknowledge the generous editorial assistance of Joan Sharpe, the patient artwork of Stuart Moss of MUN's ETV Service and Delores Wheeler and Sherry Lester for their general layout and typing. I hope this collaboration between our three MUN departments will continue in the planning of successive, equally happy Conferences to come.

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September, 1980

RESEARCH ON 'SESAME STREET': DESIGNING THE EDUCATIONAL CONTEXT

Rodney Dennis

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RESEARCH ON SESAME STREET: DESIGNING THE EDUCATIONAL CONTEXT

Rodney Dennis
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ABSTRACT

The accumulated evidence from a decade of Sesame Street research has made us aware that the auditory and visual context in which we imbed our cognitive messages must be carefully designed to insure that learning will occur. Audio-visual elements must be simplified because the educational potency of a television segment can be reduced by irrelevant details which can distract children's attention away from educationally relevant stimuli. Despite the need for simplified learning contexts, there are equally important requirements that the material be interesting and that it maintains attention. Achieving a balance of interest and education is a dynamic process involving awareness of production constraints and research guidelines.

INTRODUCTION

The cognitive effects of Sesame Street have been documented in formative and summative research studies over the past decade. The most comprehensive summative research effort was undertaken during the first two years of the show's broadcast. These large sample evaluations ($N_1 = 943$; $N_2 = 283$) demonstrated that the most frequent viewers of Sesame Street made the largest gains on several tests of cognitive abilities.

Summative research provides the Sesame Street research department with data on the cognitive effects of the show over an extended period of time. It is through formative testing, however, that researchers at Sesame Street gain insights into the mechanisms that influence the cognitive value of the show. Over the past decade, the accumulated evidence from our formative research efforts have made us acutely aware that the auditory and visual context in which we imbed our cognitive messages must be carefully designed to insure that learning will occur. Perhaps one of the most important principles for designing the learning context for preschoolers is to keep the audio-visual elements simple.

The primary reason for stressing simplicity is that the television learning context can sometimes be confusing to a preschool child. One reason for this is that the perceptual reality of young children differs substantially from the perceptual world of the adult. A three-year-old, for example, finds it difficult to disregard small irrelevant details in a television context. To facilitate effective learning, attention must be directed away from unimportant details and focused on the cognitively relevant stimuli on the screen in order for learning to occur. This task is challenging because actors, settings, and production techniques may all be relatively novel or non-familiar visual stimuli for the young viewer. And children prefer such non-familiar stimuli, according to a data from a growing body of studies (Cantor, 1968).

Data from the perceptual development literature shows that young television viewers may be oriented to perceptually salient cues (e.g. Hodapp & O'Bryan, 1975). Consequently, any variable or production feature that occurs in the televised learning context has the potential to attract a child's attention away from the educationally relevant stimuli. Furthermore, the young child lacks refined ability for differentiating objects from setting (Vernon, 1970) and for perceptual analysis (Vurpillot, 1968). Thus, young television viewers may be less likely than older children to attend to the educational information; and less likely to perceive cognitive tasks and solve them, unless the information or tasks are made visually salient with a minimum of distracting stimuli.

In spite of the important cautions that the televised learning context be relatively simple and free from complicating elements, there are equally important requirements that the show be interesting and that it maintain attention. These requirements sometime mean simplicity must be compromised to maintain a high interest level. Some of the discoveries of Sesame Street research over the past few years have given us insights into techniques for designing educational contexts that maintain preschoolers' attention and interest but do not compete with cognitive content.

A SUMMARY OF SESAME STREET FINDINGS

In a recent study of the effectiveness of remote filming locations, producers and researchers were interested in the viability of outdoor settings as educational contexts for teaching our viewers. The findings of our research indicated that the setting itself was not a detrimental factor, but that other factors related to stimulus complexity affected the teaching value of segments. One segment that we evaluated was visually simple and uncomplicated, but children still missed the point because the verbal material was not conceptually suited to their level. Verbalizations about adult themes and topics, no matter how clearly presented, will not capture the interest of most preschoolers. This principle was illustrated in the testing of a remotes location segment with Gordon and Susan (two adult cast members) shopping for food and clothing on a New York street. Although their song was catchy, the verbalization was too abstract and most children missed the message in this segment. Presumably, preschoolers are not captivated by the nuances of shopping. On the other hand, they tend to focus on details that adults might discard or find irrelevant. One child who viewed the shopping scene was convinced that Susan and Gordon were shoplifting, because he did not see them pay for the items that they picked up while singing.

Another concern in our testing of remotes segments was whether or not preschoolers could learn cultural messages about Hawaii. On the basis of our investigation, we advised the producers to keep cultural messages short and uncomplicated. In one of the tested television segments several Hawaiian children were discussing their heritages with Buffy St. Marie and Oscar the Grouch. The children, in turn, named their ethnic group make-up. When preschoolers were asked what the people in that scene were talking about, their responses ranged from the very simplistic ("They telling something") to the more cogent response of, 'Peoples' to the insightful response of "What kind of people they are". Most children could recall that the segment dealt with 'Indians'. The effectiveness of the segment in conveying cultural information was attributable, to a great extent, to the straightforward and uncomplicated presentation of information.

The verbal messages were simple. Visually, the most salient stimuli - the characters - were functional in teaching the educational message.

In the remotes study, we used our most common method of testing children's responses to Sesame Street: observing them in small groups to assess levels of attention and participation. To evaluate their comprehension of the show, children are individually questioned. Questions are carefully developed in order to obtain the maximum information without leading the respondent into an answer. Another method for assessing children's responses is the study of eye movement patterns as they watch the show. A device records a reflected beam of light from the fovea of the eye, providing accurate data on the scanning and focusing patterns of the child.

The information gathered in a recent eye movement study has indicated what happens when children see a visually complicated television display. In a segment entitled 'Number 4 Machine', the concept of number-numeral correspondence was treated by having four objects enter a machine and exit as a consolidated number '4'. The segment was visually complex, and contained a lot of action that was not functionally related to the educational content. As a result, there were too many stimulus elements in the educational content which distracted children's attention away from the objects to be counted. Children could recall the segment, but could not articulate the principle of number-numeral correspondence. The analysis of the patterns of their eye movements showed that children focus on a random fashion when the television display is cluttered with visual attractions.

In contrast to that segment was a film, Number 5 Grid that similarly dealt with transformations of objects into numbers. In that segment, children's eyes focused equally on each of the objects on the grid; a result of the visual simplicity and directness of the display.

In studies of children's ability to solve classification and sorting tasks presented on Sesame Street, it was found that children were better able to select a correct solution when the segment has certain features or clusters of features. Post-hoc analyses of these features suggest that they facilitate correct responding because they simplify either audio or visual elements of the segment.

The Sesame Street sorting (or oddity) tasks involve the presentation of four items. Three of the items share a common feature, such as size, shape, or color. A fourth item differs from the others on the selected dimension. In the classification (matching) tasks, children are presented with three items that share a common feature and are asked to select a fourth object (from two choices) to match the set. The empirical study of the effects of these kinds of segments (Dennis, 1978) involved coding them for the presence or absence of several production features. The taxonomy used to code the segments included variables related to the mode of presenting the sorting or classification; visual arrangement of the objects; and the verbal input. Table 1 lists some of the variables which were analyzed.

TABLE 1

Mean percent correct* responses in presence of clusters and individual features

	Mean Percent Correct*				
Feature or Cluster	Feature Present	Feature Absent	Difference	T Value**	Significance Level
Enumeration	39.6	56.9	-17.4	-2.74	.005
Real Objects	48.7	44.9	3.8	.85	.198
Board	44.9	48.7	-3.8	-.86	.198
Story Line	50.0	42.3	7.7	1.39	.088
Cues	43.3	48.6	-5.3	-1.05	.153
Child	44.6	48.3	-3.7	-.75	.23
Cluster 1[a]	46.1	38.5	7.7	1.14	.133
Cluster 2[b]	53.8	51.3	2.6	.37	.359
Cluster 3[c]	53.8	38.5	15.3	1.85	.038

*Mean percentage of segments in which task was correctly solved by viewer

**df=25

a-Cluster 1 features: No Child, Real, One or No Cues.

b-Cluster 2 features: No Board, Real, Child, 2 + Cues.

c-Cluster 3 features: No Enumeration, Real Objects, No Board, Story, One or No Cues, No Divided Array.

It was discovered that segments which contained a cluster of variables including Absence of Children; Use of Real Objects as Task Items; and One or Fewer Verbal Cues were associated with more accurate responses by three and four year olds.

Another cluster of variables that was associated with significant effects on accuracy of children's responses included Absence of Naming Each Object in Display; Use of Real Objects; Absence of Divided (Quadrant) Board; Use of a Story Line, and One or Fewer Verbal Cues. We interpreted the results of the study as further elaboration of the need to be careful about the simplicity of presentations to young children. This caveat holds particularly true when complicating variables tend to distract from the educational content of the television presentation. With few exceptions, the variables or clusters associated with high accuracy of performance in this study can be seen as variables which simplify the presentation both visually and verbally.

Additional examples of the efficacy of imbedding educational messages in a context that contain simplified visual and verbal elements were uncovered in a recent study of Deafness curriculum segments (Guskin et al, 1979). It was decided to investigate the effectiveness of a number of the segments involving a deaf cast member over the preceeding eight years. We hoped that an in-depth study of children's perception of these segments would provide us with specific information about the best ways to construct segments dealing with sign language and deafness. In addition, we were seeking baseline data about preschoolers' understanding and attitudes regarding deafness and signing.

The study yielded a wealth of information that is still being examined by our research staff.

One of the most dramatic findings involves children's understanding of signing. On an index of comprehension, the control group (who saw no deafness segments) obtained a mean score of 1.75, a group which viewed the segments over 3 weeks obtained a mean score of 4.40; and another group which viewed the segments, but who were also questioned daily about what they saw -- (we call this the comprehension group) -- obtained a mean index score of 7.86. The most vivid demonstration of understanding occurred in response to requests by testers that children show what sign language looked like: only 1 out of 5 (20%) children not exposed to the Sesame Street deafness segments performed any kind of hand movements, compared to 51% of the experimental group and 68% of the comprehension tested group. The ability of children to correctly identify the signs for certain words is shown in Table 2.

TABLE 2

Children's ability to correctly identify demonstrated sign

Sign	% Children correctly identifying sign		
	Cntrl	Exptl	Cmphsn
Bird	4%	16%	26%
Happy	1	4	6
Sad	5	30	46
Butterfly	8	55	71
Hat	7	23	51
Coat	10	15	46
Pants	26	34	69

The effectiveness of the instructional segments dealing with signing are related to the simplicity and directness of the presentation. Avoiding a lot of extraneous information and constructing the plot to deal directly with the information being taught are most effective. These principles are also applicable to other kinds of Sesame Street material. There is no formula for achieving the balance of education and 'entertainment' in television programming. Both researchers and producers must learn a mental set of guidelines cultivated by a body of research findings and creative intuition.

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SESAME STREET IN LABRADOR

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SESAME STREET IN LABRADOR

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ABSTRACT

Children in Cartwright Labrador viewed Sesame Street in Kindergarten and Grade I as part of their daily classroom routine. Children in Fox Harbour and Rigolet saw no television at all. Children in West Ste. Modeste had television in the community but not in school. There were initial greater gains in the Cartwright children on tests specifically designed to measure the effects of Sesame Street. These effects did not last into Grade II nor did they generalize to other standard tests of intellectual ability.

INTRODUCTION

This project extended research on Sesame Street to samples quite different in two ways from those previously studied, geographical location and age. The children in this study live in isolated communities on the coast of Labrador. Bush plane is the only method of access during the winter months, which may extend from November to June. During the summer months coastal boats travel between the communities. The villages are largely populated by subsistence level fishing families and often both parents and children are involved in the fishery. Employment is seasonal, so incomes are small and there are few of the conveniences of urban living. Most homes do not have central heating, sewage facilities, running water or the many appliances found in southern Canadian homes. The children tend to have a relatively restricted environment; few have the opportunity to travel outside the local community and there is a scarcity of books and educational materials in the homes. Further, parents are often poorly educated and do not place the same emphasis on education that middle class urban parents do. The purpose of the project was to find out whether Sesame Street could be a valuable learning experience for children from impoverished environments substantially different from those primarily urban groups for which the program was designed, or whether the program was so alien to the Labrador environment that the children would not benefit from viewing it.

A second major difference between this and previous studies was the age of the sample. Previous research used pre-school children, three, four or five years old. In this study the children were in Kindergarten, Grade I or Grade II and were five, six or seven years old. It should be noted, however, that the children in our sample function cognitively one or two years below the level expected of urban middle class children of the same chronological age. Therefore another question posed is whether Sesame Street might be a valuable learning device for children older than those for whom the program was designed, children who function below the urban middle class average for their ages.

METHOD

Three groups of children were studied. The first from West Ste. Modeste on the north shore of the Gulf of St. Lawrence had broadcast television available but no control was exercised over viewing. The second group consisted of children from two communities, Rigolet at the mouth of Lake Melville, about half way up the Labrador coast, and Fox Harbour on the southern coast. These children had no television exposure either broadcast or closed circuit. The third group was from Cartwright about half way between Fox Hr. and Rigolet on the Labrador coast. The children in this sample viewed Sesame Street daily on a Video Tape Unit in their classroom (Kindergarten and Grade One combined). The program was a regular part of their daily activity and a teacher was present and interacted with the children. That is considered to be an optimal viewing situation.

We followed two cohorts through Kindergarten to Grade I and two other cohorts from Grade I to Grade II.

The following measures were taken in Kindergarten and Grade I:

Criterion-Referenced Tests (CRT) provided to us by the producers of Sesame Street, The Wechsler Preschool and Primary Scale of Intelligence (WPPSI), the Peabody Picture Vocabulary Test (PPVT), and the Illinois Test of Psycholinguistic Abilities (ITPA). In Grade II the CRTs were not evaluated further because the vast majority of children had reached criterion on the subtests. All tests were administered individually during school hours by qualified testers.

RESULTS (Criterion-referenced tests)

i) Kindergarten to Grade One samples. The child's performance in Grade One was regressed on the Kindergarten scores separately for each of the 24 subtests. The obtained Grade One residuals (therefore independent of Kindergarten level of performance) were subjected to a multivariate analysis of variance with three factors, Cohort, Community and Sex. The results are given in Table 1. Significant Cohort and Community effects were observed. An examination of the means for each of the subtests reveals that Cohort 2 improved more on 21 of the 24 subtests. On all of the subtests on which the univariate analyses gave significant results Cohort 2 had superior improvement to Cohort 1.

TABLE 1

Results of MANOVA on standardized residuals (K-1) of criterion-referenced tests

Effect	F	df	P
Cohort (Y)	2.57	24,30	0.008*
Community (C)	1.85	48,60	0.012*
Sex (S)	1.24	24,30	0.285
YC	1.83	48,60	0.013*
YS	2.49	24,30	0.009*
CS	1.03	48,60	0.456
YCS	1.12	48,60	0.337

*significant effects.

Cartwright's means are highest on 14 of the 24 subtests, Fox Hr./

Rigolet on 7 and West Ste. Modeste on 2. Cartwright and Fox Hr./Rigolet tied on 1 other subtest. In terms of the significant univariate analyses, Cartwright was highest on 3 of the 6, Fox Hr./Rigolet on 2 and West Ste. Modeste on 1. The Cartwright dominance is consistent throughout the main categories of ability that Sesame Street fosters, namely Letters (5.5 subtests out of 9), Numbers (4 out of 7), Forms (2 out of 3), Sorting (1 out of 1), and Classification (2 out of 4). Therefore, the improvement in performance from Kindergarten to Grade 1 on Sesame Street related abilities is in favour of the children who see Sesame Street regularly in School.

A significant interaction of Cohort and Community was observed, described as follows: Cartwright Cohort 2 improved most on 13.5 of the 24 subtests while Cartwright Cohort 1 improved most on 11.5. Meanwhile Cohort 2 from Fox Hr./Rigolet scored highest on only 4.5 subtests while Fox Hr./Rigolet Cohort 1 scored highest on 11.5. West Ste. Modeste Cohort 2 scored highest on 6 and West Ste. Modeste Cohort 1 on only 1. Therefore, the interaction is due to the relatively weaker performance of the Cartwright Cohort 1 with respect to Cohort 2; the stronger Fox Hr./Rigolet Cohort 1 performance as opposed to Cohort 2, the stronger West Ste. Modeste Cohort 2 performance over Cohort 1. In terms of the main divisions of Sesame Street material, both Cartwright cohorts showed the most improvement on Forms and Classification; Cartwright Cohort 2 was strongest on Numbers and Sorting; in Letters the Cartwright cohorts were bettered by the other communities. In short, then, the Cartwright improvement is consistent across two cohorts for Sesame Street related material. The inconsistency is in Letters and Numbers both of which are likely covered in Kindergarten programs anyway.

A Cohort by Sex interaction was also observed. Cohort 1 Females improved more than Cohort 1 Males on 14 of the 24 subtests while in Cohort 2 the females showed more improvement on 18 of the 24 subtests. There do not appear to be any differences in the main categories of material covered by Sesame Street expect that the females are consistently better on the Letters subtests.

ii) Grade one to Grade Two samples. Since by the end of Grade Two all groups had achieved near maximum performance on the Sesame Street subtests no analysis of the change from Grade One to Grade Two was carried out.

RESULTS (Norm-referenced tests)

i) Kindergarten to Grade One samples. The same type of analyses as for the criterion-referenced tests was carried out on the 23 norm-referenced tests (12 subtests of the Illinois Test of Psycholinguistic Ability; 10 subtests of the Wechsler PPSI; the Peabody Picture Vocabulary Test). The result of the multivariate analysis on variance on the standardized residuals is shown in Table 2.

TABLE 2

Results of MANOVA on standardized residuals (K-1) of norm-referenced tests.

Effect	F	df	P
Cohort (Y)	2.069	23,31	0.030*
Community (C)	1.824	46,62	0.014*
Sex (S)	1.061	23,31	0.433
YC	1.323	46,62	0.151
YS	0.701	23,31	0.809
CS	0.839	46,62	0.731
YCS	1.172	46,62	0.278

*significant effects.

Significant Cohort and Community effects were observed. The second cohort showed greater improvement than the first on 16 of the 23 subtests. All the significant univariate tests were on the ITPA.

The Community that showed the greatest improvement was the Fox Hr./Rigolet sample which was highest on 10 of the 23 subtests. The performance was consistent across both the ITPA and the Verbal and Non-Verbal parts of the WPPSI and the PPVT. Therefore the children not exposed to television at all showed the best overall improvement in general linguistic and intellectual abilities.

ii) Grade One to Grade Two samples. The standardized residuals showing the change from Grade One to Grade Two were subjected to a multivariate analysis of variance. The results are given in Table 3 again indicating significant Cohort and Community effects.

TABLE 3

Results of MANOVA on standardized residuals (1-2) of norm-referenced tests

Effect	F	df	P
Cohort (Y)	4.645	23,29	0.001*
Community	1.669	46,58	0.032*
Sex (S)	0.820	23,29	0.684
YC	1.302	46,58	0.170
YS	1.139	23,29	0.366
CS	1.214	46,58	0.240
YCS	1.172	46,58	0.282

*significant effects

The first Cohort did marginally better than the second on 12 of the 23 subtests. However on the ten subtests on which the univariate analyses were significant the first Cohort excelled on six. The second Cohort's superior performance were on the ITPA while the first Cohort was better on the WPPSI.

The Community effect is clear. The Fox Hr./Rigolet sample was superior on 15 of the 23 subtests. The most marked improvement was on the Verbal scale of the WPPSI where the Fox Hr./Rigolet sample was highest on three of the four subtests that gave significant univariate effects. These results are similar to those found in K-1. The children with no television at all showed the greatest improvement in general abilities.

CONCLUSION

Older children who see Sesame Street in school show initial but short-lasting benefits. By the end of Grade II children in all three of our groups were functioning at much the same level.

ACKNOWLEDGEMENT

This research was completed with the help of grants from the Canada Council (now Social Sciences and Humanities Research Council) and the National Research Council (now Natural Sciences and Engineering Research Council). A preliminary version by Skanes and Taylor appeared as 'The effects of Sesame Street in isolated Communities', Integrateducation 15, 15-17 (1977).

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VIDEOTAPES FOR CORRESPONDENCE IN ECONOMICS: PRELIMINARY RESULTS AT THE FERNUNIVERSITÄT HAGEN

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VIDEOTAPES FOR CORRESPONDENCE EDUCATION IN ECONOMICS

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ABSTRACT

The Fernuniversität in Hagen, which is the only distance learning University in the Federal Republic of Germany, has provided for the development of audio-visual material. In the university's Institute for the development of distance study, media experts, psychologists, mathematicians, economists, and educationalists work together to develop pilot productions. This paper describes a typical evaluative project by the Institute, in which a video program was produced with a short accompanying text. A questionnaire revealed that students had profited from the tapes which had given them a better understanding of macro-economic models. Choise of colours and lay-out were judged favourable. Some graphical presentations were critized. The oral delivery of the authors should be less monotonous. Fifty percent of the students asked for more written information. The accompanying text was in general found to be useful.

PRESENT STATE OF DEVELOPMENT OF AUDIO-VISUAL AIDS IN ECONOMICS

Up to now little use has been made of audio-visual aids in university level education in the Federal Republic of Germany. In economics there are - to the best of our knowledge - hardly any instruction of films at this level.

In contrast to this there are for example in connection with high school correspondence education regular broadcasts on the various sectors of economics. The lack of instructional films in university tuition may have a variety of reasons, for example:

- most universities are not sufficiently equipped either with the necessary hardware or the manpower to make use of it;

- most of them lack the necessary know-how to transform traditional instruction into audio-visual teaching;
- they have not sufficient financial means to provide this relatively expensive method of instruction nor do they show willingness to cooperate with one another in order to make such methods possible;
- they seem to fear that traditional methods of teaching will be replaced by audio-visual programs.

The 'Fernuniversität in Hagen', which is up to the present the only distance learning University in the Federal Republic of Germany, has, in contrast to the traditional universities, provided from the beginning the preconditions for the development of audio-visual material in addition to written course material. These preconditions were realized by the foundation of a special institute within the university, called the 'Institute for the Development of Distance Study'.

In this institute media experts, psychologists, mathematicians, economists and educationalists work together to develop pilot productions in distance study. For the production of films a video studio of semi-professional character has been installed. At present it has not proved possible to provide regular broadcasts for the German Distance University. Though video-cassettes are available to students in fifty study centres located over a wide area of the FRG. The cassettes may also be borrowed by students directly.

ORIGIN OF THE VIDEO PROGRAM: Macroeconomic Models

In distance education at our university - just as at the British Open University - the core of teaching is the written text. The correspondence text on 'Macroeconomics' forms part of the second year of graduate studies in economics, and occupies a total of 280 hours' study time. Most of the students criticized the written material with respect to the following points:

- the exposition is too abstract;
- the content has been presented too mathematically;
- there are not enough exercises;
- the guidelines are difficult to follow.

On the basis of this criticism some corrections were made, in particular, some exercises have been improved. The basic structure of the original course however has been preserved. At the same time the author, M. K. Evans, asked the Central Institute for the Development of Distance Study to provide additional audio-visuals to accompany the written course.

CONTENT AND CHOICE OF MEDIA

The supplementary instructional material had mainly two objectives:

- first, to give students a guideline for the better understanding of macroeconomics by clarifying the construction principles of mathematically formulated economic models;
- second, to encourage students to study mathematical methods more intensively. This was expected to be achieved by showing the possibilities of application of economic models to basic theoretical analysis.

It was not meant to provide an explanation of specific economic theories.

To keep the program highly flexible with respect to its use at various times and places a self-contained program was worked out having only a loose relationship between this media and the text on macroeconomics.

With respect to the choice of media, the possibility of using an audio-visual program using slides was considered as an alternative to video tape. A decision was made in favour of video. To understand the working of economic models the patterns of reaction can be more easily shown by video. Besides this, video cassettes are easier to use.

A didactically important element of the video program was a short accompanying text containing learning objectives, exercises and supplementary information. The exercises had to be dealt with at different points on the video tape. The students are asked to stop the tape, to do the exercise and then continue with the tape.

The procedure has mainly two advantages:

- there is a continual change between active and passive learning;
- a continual self-control on the part of the student concerning the learning objectives.

PRODUCTION OF THE VIDEO-TAPES

The exposé had the form of a simple scientific text without any graphical illustrations. This text has to be transformed into a film script containing ideas for visualization of the contents presented mainly in form of a trick-film.

In the storyboard the different takes, special tricks and the final text had to be worked out. For the preparation of animation design, sketches of important sequences had to be provided. The final drawings and the other subsequent stages of making the film were done externally, as our own studio was not yet ready for production at that time.
The film script was sent to six students for evaluation purposes. They were asked to comment on the comprehensability of the contents, the presentation of the graphical illustrations and the usefulness of the exercises. Furthermore they were asked to note the time they spent on different parts of the program. The evaluation provided some interesting information.

FIRST EVALUATION OF A QUESTIONNAIRE

As mentioned above, the video-tapes can be used by students at the study centres or borrowed directly. A questionnaire was attached to the accompanying text, which is part of the video-program. Questions on the following points were asked:

- did the tapes make for better understanding of macroeconomic models?
- did you solve the exercises?
- how do you rate the graphical presentation?
- do you think it is desirable for the authors (that spoke the text) to appear on the screen?
- did you have any problems with the handling of the video player?
- do you think supplementary instructional material is necessary?

The results may be summarized as follows: All students said that they had profited from the tapes which had given them a better understanding of macroeconomic models. Choice of colours and lay-out were judged favourably. Some graphical presentations were criticized. The oral delivery of the authors should be less monotonous. Fifty percent of the students asked for more written information. The accompanying text was in general found to be very useful.

NEED FOR FUTURE INVESTIGATION

The video-program just discussed is intended rather as supplementary tuition which aims at illustrating some basic ideas of the correspondence text. A different kind of video film produced by us more closely related to practice, tried to illustrate the principles of cost allocation and the appropriate computational methods in the case of automobile production. This film aims rather at supplementing the correspondence text than directly providing a better understanding of the actual correspondence text.

It will therefore be an important task for us to find out what types of supplementary aids students prefer. But it should also be pointed out that such investigations can only demonstrate whether students of economics prefer solid scientific information or instructional aids with more illustrative character and additional motivation of a practical kind. Some experiences of the Open University point to the first alternative. (Bates, 1976)

The problem to what extent video tapes are effective instructional aids in addition to correspondence texts in the study of economics is still unsolved.

From known media-taxonomies no definite conclusions can be deduced for single media decisions. It would be therefore rather interesting to know, whether there is an optimal media-integration for at least some typical problems in the field of a special discipline like economics in distance education.

In this context some evidence from a recent investigation on managerial economics should be noted (Grunauer, 1979). The objective of this research work was to compare lectures, audio-visuals using slides and films, each with the same information. The topic dealt with was the 'derivation of policy guide lines for a private firm'. The results are as follows:

- lectures by a good lecturer can hardly be surpassed by audio-visuals with slides or a film when compact knowledge is to be imparted;
- as a complementary aid or substitute audio-visuals may be useful;
- films may have advantages compared with audio-visuals with slides when real life situations or demonstration of movement are of major importance.

A serious problem for investigations which compare alternative media while leaving the contents unchanged may arise from ignoring the interdependence between the choice of the medium and the underlying contents. The various media can be regarded as fairly good substitutes for each other where a given content has to be represented. It seems therefore to be important to show the new quality of an integrated teaching package which uses different media compared with the traditional medium for distance education, the written text alone. In developing such a teaching package media-taxonomic considerations may be helpful at a preliminary stage. When measuring the efficiency of the alternatives mentioned not only the scores of cognitive texts should be counted but memory and motivation should also be investigated.

FINAL REMARKS

The video-tapes discussed and the following suggestions may give an impression of our approach to audio-visuals. In the initial phase of the university the development of correspondence texts was of major importance. In addition to this, the first audio-visual productions of different types were developed by the Central Institute for the Development of Distance Study. Evaluation of these productions was made during production as well as after completion. A task for future research will be to find out student's preferences for some of the alternatives worked out. Furthermore experimental situations are to be created in order to test not only by rating audio-visuals but also by measuring the influence of audio-visuals on certain skills. In this way it should be possible to make future decisions with regard to the choice of media on a somewhat sounder scientific basis.

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WATCHING SLOW LEARNING CHILDREN WATCH TELEVISION

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ABSTRACT

This research was conducted in order to determine what factors affect how slow learning children viewed the screen of educational television programmes. The measure of attention used was that of the eye movements of the children on and off the screen in a school setting. It was observed that several factors emerge, those related to the viewers themselves and those concerning production styles.

INTRODUCTION

Educational television can make a valuable contribution not only to the education of normal children, but also of handicapped children. In a survey of the use of television in schools for such children, Edwards (1974) showed how educational television programmes were used for children with handicaps ranging from that of slight educational subnormaltiy to hearing impaired and visually and physically handicapped children. A large part of this work was devoted to detailing the strategies used by teachers of such children to increase the effectiveness of the programmes used.

In the course of using educational television with slow learners and children with less than normal intellignece for a variety of reasons, it was observed that whilst topics and contents of particular programmes might be suitable to those children, certain programmes seemed to attract their attention more than others, and within each programme different types of presentation had varying effects on their level of attention. Some doubt was felt about the extent to which educationally subnormal children were able to comprehend some of the sequences, and parts of the commentary in the programmes, and this difficulty in understanding seemed to be reflected in their level of attention.

The aim of this research was to observe slow learning children while viewing educational television programmes in order to determine what factors affected how they viewed the screen. It was felt inportant that the children viewed the programmes in their mormal school surroundings, with all the usual difficulties and distractions involved. Educational television programmes are rarely seen in ideal situations, and it is important to record the reactions of the children in the school setting. In order to learn from television, it can be assumed that the child must in fact watch the screen, and therefore a measure of attention to the screen was used to assess how children watched the programmes. The measure of attention used was that of the eye movements of the children on and off the screen.

Previous researchers concerned with young children watching television have used a measure of visual attention to the screen in order to estimate programme worth in some way (Hines 1973, O'Bryan 1976, Anderson & Levin 1976). This research has shown both that children start watching television at a very early age, at about 30 months, childrens' attention to the screen was significant (Anderson & Levin 1976) and that attention to the screen was increased in the presence of some visual and auditory elements are, however, programmed, i.e. women presenters normally appeared with children, music and dancing, men with still drawings and in relatively static settings, so it was not possible to infer directly which elements affected the children's viewing. Also in these experiments the children viewed the programmes in strange surroundings, rooms where the necessary video equipment was hidden, rather than at home or school.

Morris (1976) on researching pre-school childrens' reactions to two programmes, used the same technique of video recording the children viewing the programmes and relating their attention and verbal utterances to the sequences in the programmes. This research also showed that children's attention was increased in the presence of lively action and decreased during long, static sequences. However, a compromise had to be reached between recording the childrens' reactions as they viewed at home and the restrictions imposed by the equipment.

OBJECTIVES OF THE STUDY

The aim of this study was to record slow learning children watching several educational television programmes in their normal school surroundings and find out which factors influenced their level of attention to the screen. In order to do this, the reactions of groups of children in three special schools for slow learning children were video recorded as they viewed four programmes. The factors considered to affect level of attention were:-

- chronological age;
- general mental ability;
- sex of the child;
- presentation styles used in the programmes.

As a result of a brief pilot study which enabled the limitations in the use of the equipment to be discovered, a further factor was added to the above list, that of certain personality traits of the children. It was apparent that some children were generally more distractible than others, and this needed [illegible]ken into account in the main study.

METHOD

i) Tests

The age and sex of the subjects were easy to define, general mental ability and personality traits more difficult. In order to test for general mental ability, each child was tested by the researcher using The English Picture Vocabulary Test. This test, which is very similar to the Peabody vocabulary test, does not require the child to be able to read or write. The child chooses the correct picture from a group of pictures to illustrate a given word. The measure of vocabulary ability which this gives is a good indication of general mental ability.

In order to obtain some measure of the personality traits of the children which might affect their viewing behaviour, an assessment scale designed for use with subnormal children was used. This scale was completed by the class teacher for each subject and gave a numerical value to the personality traits of distractibility and excitation.

ii) Design

Four educational television programmes - A) Sesame Street, B) The Electric Company, C) Alive and Kicking, and D) Stop, Look, Listen were shown to groups of slow learning children in the 10-11 age range. There were three groups of children in each of three schools. One of the programmes - D) above - was also shown to children in the 8-9 and 12-13 age range.

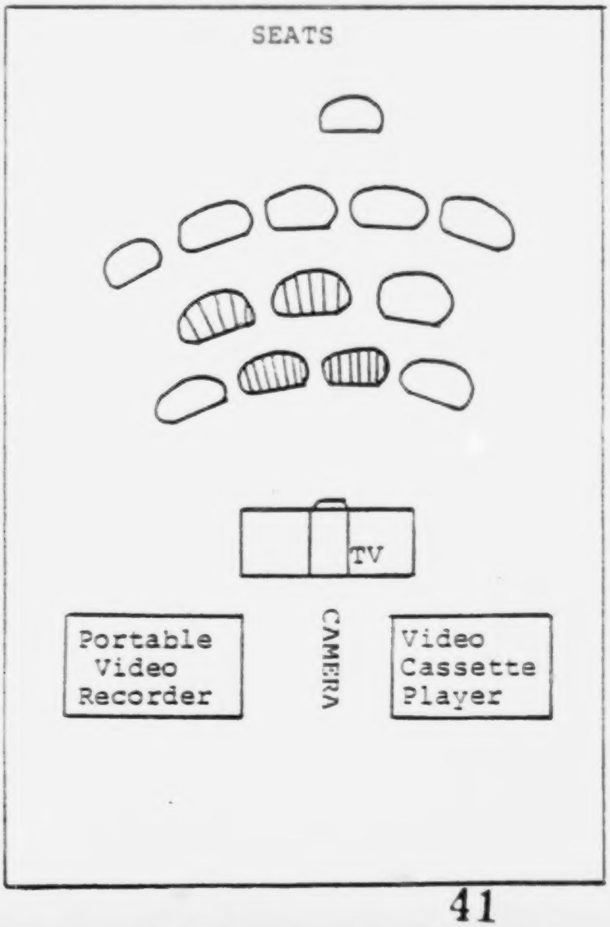
TABLE 1

Programmes

AGE RANGE	A	B	C	D
8 - 9 YEARS				32
10 - 11 YEARS	36	36	36	36
12 - 13 YEARS				36

It proved possible to record the reactions of four children simultaneously by placing a portable video camera on top of the television set the children would be watching, and carefully positioning four of the groups of chairs so that the four chosen children were in shot. (Figure 1). With the younger children, it was more difficult to place them as they tended to move about a lot. A video cassette recorder was used to replay the chosen programmes. The equipment was hidden behind the television set and the children easily became accustomed to it. By recording their reactions in this way, the resulting video tapes showed the children looking directly towards the camera, and any eye movements off the screen were easily noted. The researcher, who was known to the children, stayed with the children while they viewed the programmes; the class teacher did not stay.

FIGURE 1
Viewing situation



THE PROGRAMMES USED

Choosing the four educational television programmes for this research proved rather difficult. Each programme had to fulfil two criteria; it had to appeal to the age range of the viewers and had to use several different presentation styles.

The programmes chosen fell into two categories. The two American programmes used the cafeteria format, that is presenting separate segments of information, each being independent of the others. The two British programmes used a sequential story-line format.

The two American programmes chosen were The Electric Company - this is an edited version to cut out the main americanisms. It was considered suitable for use with the 10-11 age range and used presentation styles such as puppets, animation, presenters, children. The other American programme Sesame Street was considered suitable despite being made for pre-children.

The two British programmes differed in many ways from the American programmes. Alive and Kicking was made for 6-7 year olds, to teach them general health skills. The programme used was about clothing, what different clothes are used for and how specialised clothes can be used for protection. The programme, which had a male presenter, showed police divers in their wet suits and speedway riders in their protective clothing, before showing two young children getting up and dressed in the morning.

The other British programme, from the series Stop, Look, Listen, was about firemen putting out a fire, and showed the sequence of events from the fire alarm ringing to the firemen clearing up. Emphasis was placed on all the sounds used in this process. This series was disigned for use with slow learning children. It was this programme which was shown to all three age ranges of children.

When the classes had seen the programmes, and the video tapes of the reactions of the four chosen subjects from each class had been assembled, the attention of each subject to each programme was measured. To do this, the researcher used a keyboard attached to a computer. By depressing a key, the length and psoition within the programme of each period of inattention was noted. By watching the four programmes, it was possible to divide them into segments which used different styles of presentation. Using the computer, the length and position of each of these segments was noted and the two sets of timings - those of programme segments and periods of inattention of the children - were related. The resulting printout gave the inattention of each child to each segment in 1/10 secs.

DISCUSSION OF RESULTS

The results of this work fall into two main categories:-

1. The factors which affect the attention of the children in the three age ranges to one programme.
2. The factors affecting the attention of the smaller group of 10-11 year olds to four programmes.

Considering the first group who saw the programme Stop, Look, Listen about firemen - it was apparent that the main factor which affected level of attention to the screen was that of the sex of the viewer. This result could be expected, but the degree of the effect was quite striking. Boys inattended for 9% of the time, girls for 19%. The next most important factor was that of chronological age. The younger children were considerably more inattentive than the older group:

8 - 9 years	15.5%	inattention
10 - 11 "	14.1%	"
12 - 13 "	9.0%	"

The third factor affecting attention was that of distractibility. The more distractible a child was the less he attended to the screen, but this effect was small in comparison to the two above. The factors of general mental ability and excitability had no significant effect on level of attention.

From a graph showing how the level of inattention of each age range varied for each segment in the programme, it was evident that the pattern of attention for each group was very similar. All groups tended to watch the same sequences. Those sequences which held attention well used lively actions of some kind, and all contained easily recognisable elements. The sequences which the children did not watch were presented in a relatively static manner or contained unfamiliar elements.

Consideration of the smaller group of children aged 10-11 who saw all four programmes showed that no one factor was a major indicator of level of inattention to all the programmes. There was no significant difference in the amount of inattention between programmes. What was apparent was that there was a significant stability of level of inattention across programmes for individual subjects; that is if a subject was inattentive to one programme he was likely to be inattentive to the others.

In the larger sample, again no one factor was a major predictor for inattention for all the programmes. The distractibility of the subject was a major predictor of inattention for Alive and Kicking and The Electric Company; vocabulary age for Sesame Street and The Electric Company: chronological age for Sesame Street; sex for Stop, Look, Listen, the programme about firemen.

No sex difference, however occurred in attentiveness to other programmes about police divers and motorbike riders, which could also be considered to be more intrinsically interesting to boys than girls. This apparent discrepancy may be accounted for by the fact that the programme showing police divers and speedway riders used a presenter to whom both sexes seemed equally attracted.

Although general distractibility of the children was a highly significant factor for the programmes Alive and Kicking and The Electric Company, and slightly less so for Sesame Street, it was not significant for the programme Stop, Look, Listen.

It is possible that the exciting auditory changes which are an integral part of this programme may help to hold the attention of the more distractible children. This programme has a strong storyline which may hold the attention of the distractible child.

Apparent during Alive and Kicking was the fact that the children did not attend well to sequences containing the noise of the speedway bikes. It was a most unpleasant sound and frequently drowned out the presenter's voice. As this 'noise' factor was not present in any other programme, it could be this which accounted for the high rate of inattention by the distractible children.

The Electric Company programme used a presentation style - that of words and letters appearing on the screen - which did not appear in any other programme. Peaks of inattention were recorded for sequences in which the presentation of words on the screen constituted a major part. It is understandable that distractible children who have difficulty in basic literacy skills, will be inattentive to these sequences. This finding poses questions for the use of words and letters on the screen to help distractible children with related abilities.

When the inattention of the children to the different sequences in the programmes was calculated , it was seen that children attended most to sequences using animation, showing children on the screen, and to those with elements of anticipation. The sequence to which they attended most was a short sequence of a close up of a female presenter's face which had no background detail to distract the children.

The sequences to which they did not attend were relatively long; with little visual activity - as when a puppet conducts a monologue; also those scenes with loud noises and sequences presenting words on the screen unrelated to any other visual information. Often the above categories interact and one presentation style is counteracted by another. For instance, the sequence to which the children attend most has static presentation and shows words on the screen, but the technique of focusing on an interesting face and excluding anything which might be distracting counteracts this visual inactivity.

The finding that there was no significant difference in level or patterns of attention to different programme formats was rather surprising. The results indicate either that children have very catholic tastes in television viewing or that their overall perception of the programmes is not clear.

CONCLUSION

This study has shown how the attention of slow learning children to educational television programmes is affected by several factors, those relating to the viewers themselves and those concerning production styles. The study may be viewed as an introductory step in the important field concerning children's understanding and perception of television.

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MEASUREMENT OF STUDENT ATTITUDES AND ACHIEVEMENT FOLLOWING LIVE AND VIDEOTAPED INSTRUCTION

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MEASUREMENT OF STUDENT ATTITUDES AND IMMEDIATE AND LONG TERM ACHIEVEMENT FOLLOWING LIVE AND VIDEOTAPED INSTRUCTION

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ABSTRACT

This experiment presented 338 first year university students in psychology with four different types of live or videotaped instruction on the concept of cognitive dissonance. Their achievement was measured using a pre and post-test procedure and their attitudes toward the instructor were assessed, using semantic differential attitude scales. Results showed that performance on achievement tests was generally better on the immediate post-test following live conditions, but was better on the retention test following videotaped conditions. Significant differences among conditions also emerged in the attitude data. The live condition was rated more favorably on all three attitude factors that emerged from the scale using factor analysis. When the combined live conditions were compared with combined studio conditions, the live was rated more favorably on an integrity factor, while when a comparison of direct methods of instruction with indirect methods was made, the direct methods were rated more favorably on a general evaluative factor. These factor analytic findings coincide with others reported by Baggaley (1978).

INTRODUCTION

The vast amount of research that has compared the effectiveness of various instructional modes over the past twenty years has not yielded consistent or reliable differences in favor of any mode of presentation (Chu & Schramm, 1967; Dubin & Hedley, 1969; Trent & Cohen, 1973). As Barbatsis (1978) has pointed out, the basic question of whether televised instruction is better or worse than live presentation has not been conclusively answered.

The inadequacy of this area of research can be explained by several factors.

The majority of studies done have been of the summative research type, which, recent researchers have clearly argued, is premature and inappropriate at this time (Barbatsis, 1978; Bates 1974; Palmer, 1973). Secondly, most studies of this type have been criticized as lacking experimental rigor, specifically in terms of

(a) inadequate controls, (i.e., student learning outside of the lecture conditions has not been controlled, measured or eliminated);

(b) the dependent variable (i.e., student learning) has not been measured with any degree of precision (Stitckell, 1963; Campeau, 1974; Sullivan, 1974).

However, attempts have been made to conduct studies with tighter control procedures and more precise measurements. Such studies, in fact, do yield consistent findings. The work by Sullivan and his colleagues at Memorial, extending over five or six years has produced consistent results over many replications using uniform methodology.

For example, in 1971, Sullivan & Hartley, using the cummulative curve as subject matter, compared the learning effectiveness of the following methods of instruction:

(1) Live Lecture -- regular in-the-classroom instruction.
(2) Studio-produced Videotapes -- traditional made-in-the studio tapes, including slides, film clips, etc.
(3) Videotape of live lecture -- the videotape of method one.

Results indicated that students achieved a significantly higher level of learning after the live lecture than after either of the other two modes, and that the videotape of the live lecture produced significantly more learning than the studio tape. Comparable results have also been reported by Goss & Croft (1976), whose research was similarly designed and controlled, and by Sullivan, Andrews, Maddigan & Noseworthy (1975).

During the past four years further studies have been carried out by Sullivan and his colleagues at MUN. (Sullivan et al., 1978).

Basically, these studies have found consistently that student achievement following a live lecture is significantly superior to that following all other modes. The videotape of the live lecture and the live lecture with visuals (presenting the visual material of the studio tape live in the classroom with appropriate instruction) do not differ significantly, but both modes show an achievement level significantly higher than that of the studio produced videotape. This finding holds true for all types of subject matter, provided that the following conditions are met:

i. the subject matter is such that it is novel but interesting, its achievement can be measured precisely; and the subjects' initial level of prior knowledge is low;

ii. the experimental design permits both teaching and testing during the one class period;

One reason for comparatively low achievement test scores following videotaped instruction may be associated with one or both of the following factors:

1. Some students, especially the low ability -- high introverted -- high anxiety group do not perform as well following a novel and impersonal method of instruction as they do following a familiar and personal one (an individual difference variable);
2. Adding additional illustrative material to the videotape may actually detract from learning -- at least in the short term (a mode of presentation variable).

However, Sullivan et al., (1979) have pointed out that their research suffers from several important defects and inadequacies:

1. The experimental situation is a single, short lecture situation, with a captive audience whereas most learning situations consist of a series of lectures, with voluntary attendance and viewing. For these circumstances, a different set of results would undoubtedly be found.
2. The results were based on immediate learning, but obviously in a practical situation, long term retention is of more importance. (However, in all experiments, retention test results were contaminated by an in-or-out-of-class learning experience for some of the students. Material was always included in the curriculum of the semester in which the experiment was carried out; i.e., some of the instructors covered the material in class while others asked the students to study it on their own.)
3. Also, from an experimental point of view, the scripts should have been identical for all conditions. In practice, although the learning objectives were the same for all conditions, and the scripts similar, the scripts were only identical in two of the conditions: (live lecture and videotape of the live lecture. For the other two conditions, live with visuals and the studio tape, the scripts were similar but not identical).

However, to support this general line of research, it should be noted that others working in related areas have found similar consistencies using viewer attitude as their dependent measure. For example, Brown (1975) and Frazer (1975) have shown that the liking of the particular method of instruction (and its instructor) is positively correlated with learning from that method. Other investigations, using sophisticated attitude and rating scales (Baggaley, 1978; Baggaley and Duck, 1976; Coldevin, 1975; 1977) have consistently shown that variables such as lecturer's age, background, expertise, mode of presentation, etc., can produce differential viewer attitudes. The manipulation of these variables in short (1 - 3 minutes) videotapes have resulted in the lecturer being rated significantly different on viewer attitudes relating to integrity, empathy, competence, etc.

The present research was intended to eliminate or drastically reduce the difficulties and inadequacies of previous studies by means of a better designed and more carefully controlled experimental setting. It was also planned to broaden the scope of the research to include material on attitudes, thereby testing the findings of Baggaley, (1978), and by attempting to determine whether there was a relationship between attitudes and achievement.

No specific hypotheses will be stated as the area is still, to a certain extent, exploratory and investigative in nature. There is not a sufficient data base upon which to base a theoretical framework for the area so the emphasis here was on collection of information and inspection of it to see what conclusions and plausible explanations were possible.

METHOD

Subject:

The subjects were 338 first year students registered for the Introductory Psychology course at MUN. These subjects comprised 8 class groupings or sections.

Materials and Design:

The topic selected for the subject matter was Festinger's concept of cognitive dissonance. This topic was selected because it met the following criteria:

1. the subject's previous knowledge of this topic was judged to be very low, and therefore, the pattern of learning should not be contaminated by varying levels of previous experience across sections;
2. the topic was important and relevant for Introductory Psychology students;

3. its basic fundamentals can be encompassed in one twenty minute period;
4. knowledge of its basic facts can be measured reliably and accurately by a well-constructed post-test;
5. the topic lends itself to novel application problems and these can also be measured reliably through application-type questions;
6. it is moderately difficult topic and a carefully constructed post-test would yield a wide range of scores such that a 'ceiling' or 'floor' effect is not likely to be encountered;
7. it is a relatively interesting topic, and one that lends itself to examples that can be demonstrated visually;
8. the topic was included very near the end of the first semester of the Introductory Psychology course. This permitted a retention test to be included during the first semester with little chance of contamination through intervening learning.

Secondly, four different methods of instruction were prepared as the experimental treatment. These were:

1. Live Lecture (LL) -- traditional live instruction where the instructor was oriented to the students. No equipment was present in the teaching -- learning setting.
2. Live Videotaped (LV) -- the same live instruction as in (1) above, but in this condition an ETV crew was present for the purpose of videotaping the lecture, but the students who received the live instruction were the ones tested.
3. Videotape of Live Lecture (VL) -- the videotape of condition (2).
4. Studio-Produced Videotape (SV) -- traditional made-in-the-studio videotape. This tape included slides, film clips, etc. The instructor was the same for all conditions and the scripts were identical.

It is important to note that these four conditons provided two additional basic comparisons.

1. A combination of the live lecture and the live videotaped versus the combination of the videotape of the live and studio tape provided a basic comparison of live versus videotaped instruction.

2. In the live videotaped lecture and the studio videotape of the live lecture, there was no readily identifiable evidence that equipment was being used. So a combination of the live lecture and the videotape of the live, versus a combination of the studio tape and live videotape provide a comparison of a direct, personal condition versus an indirect, impersonal condition.

The following evaluation instruments were also prepared:

1. A pre-test -- consisting of 5 multiple choice items used to determine the level of previous knowledge of the subject matter.

2. A post-test -- consisting of multiple choice items, application questions and short essay to assess learning.

3. A retention test -- a parallel form of post-test.

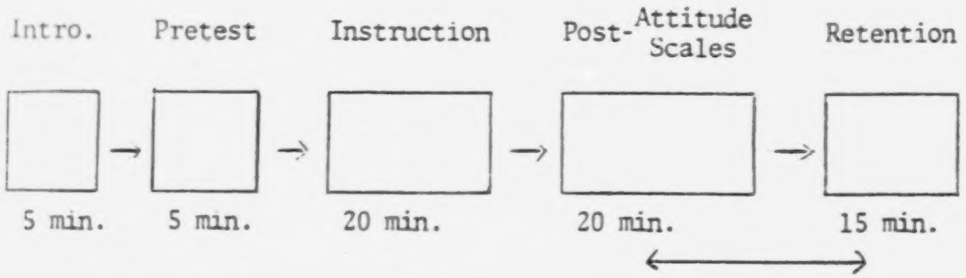
4. In addition, the 20 semantic differential scales which Baggaley (1978) had used to assess attitudes toward TV instructors.

PROCEDURE

Two classes were randomly assigned to each of the four experimental conditions and each class was subjected to the experimental design graphically depicted in Figure 1.

FIGURE 1

Experimental Design



Testing took place during a regular class period. A standard introduction was given by a member of the research team explaining very briefly that we were conducting research on different types of instruction in first year university. Then each class was tested. In the first five minutes the pre-test was administered, followed by the experimental treatment, post-test and semantic differential scales used. For all four methods the lecturer was the same person. Two weeks after the experiment a twenty-minute retention test (a parallel form of the post-test) was administered.

RESULTS AND DISCUSSION

I. Achievement Test Measures:

(a) Immediate Post-test scores

Table 1 gives the results for all Ss on Grade Xl average, pre-test score and post-test score. This table shows that there were no apparent differences among groups on Grade Xl average, or pre-test scores. The differences among groups on post-test scores were not significant either but the direction of the results is the same as that of previous research (live conditions being better than videotaped conditons).

TABLE 1

Means and standard deviations for grade XI, pretest and post by condition

		Grade Xl		Pretest		Post	
Condition	N	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1 Live	78	74.63	8.11	1.95	0.98	11.42	3.35
2 Live Vted	52	74.17	8.26	1.69	0.90	11.52	3.41
3 Vt-LL	73	74.30	8.97	1.84	1.03	10.63	3.04
4 Studio	57	74.25	8.81	1.93	0.90	10.56	3.36

The post-test scores were then adjusted by regression techniques to take into account the possible effects of person variables that could not be equated (such as Grade Xl average and pre-test) but which could influence the prediction of post-test score as much as condition would. The results of this procedure are given in Table 2 , which shows that, in fact, the only significant predictor of post-test scores is Grade Xl average. Combining the effects of these variables gives us the best predicted values of PT, which are given in Table 3. Again the order of the means is the same as in previous research, but t-tests showed no significant differences between the individual groups. However, when the combined live-videotaped conditons were compared, the live conditions performed significantly better. The direct - indirect comparison produced no significant difference. These results are summarized in Table 4.

TABLE 2

F-Ratios from regression analysis on post-test

	POST - TEST	
	F-Ratio	Prob.
Grade Xl by Condition	0.73	N.S.
Grade Xl	35.76	.01
Pre-test	0.16	N.S.
Condition	2.21	N.S.

TABLE 3

Adjusted means and standard deviations for post-test by condition

CONDITION	N	POST-TEST ADJUSTED MEAN	SD
1 Live	78	11.50	3.35
2 Live Vted	52	11.57	3.41
3 Vted of Live	73	10.67	3.04
4 Studio	57	10.43	3.36

TABLE 4

Means, standard deviations and t-tests for comparisons between combined experimental conditions on post-test

CONDITION	N	X	SD	T	PROB
1 and 2 (Live)	130	11.53	3.35	2.34	<.05
3 and 4 (Vted)	130	10.57	3.16		
1 and 3 (Dir.)	151	11.10	3.22	0.32	N.S.
2 and 4 (Indir.)	109	10.97	3.43		

In short, the results of the immediate post-test were highly similar to those obtained in previous investigations. The order of results (Live, Videotape of live, Live Videotaped, Studio) is the same as before, and the important comparison of live vs videotaped conditons is significant. When the fact that these results were developed from a study which involved greater experimental rigor (e.g., all four conditions used identical scripts, and regression analysis was used to account for extraneous variation), this is an impressive result and certainly provides evidence to support the validity of the investigations carried out previously.

(b) Retention Test Scores

The retention test scores for the data and the scores adjusted by regression procedures are presented in Table 5, the significant regression predictors being Grade Xl average, condition and post-test score. The change in order of the scores from post-test to retention test are also shown graphically in Figure 2. It can readily be seen that the order of the achievement test scores on the retention test is almost completely reversed in comparison with the post-test scores. Condition 4 scores are significantly higher than condition 1 and 2 scores (condition 4 versus condition 2, $t = 2.35$, $p < .05$). Moreover, the crucial comparison of live versus videotaped, as presented in Table 6 shows a significant difference in favour of the videotaped conditions. The direct versus indirect comparison again does not yield a significant result.

TABLE 5

Means and standard deviations for retention (raw & adjusted) by conditions

		RETENTION		RETENTION
CONDITION	N	$\bar{X}$	SD	ADJUSTED $\bar{X}$
1.Live	79	10.79	3.66	10.49
2.Live Vted.	53	10.28	3.70	10.12
3.Video Live	57	10.46	3.31	10.88
4.Studio	57	11.32	3.09	11.66

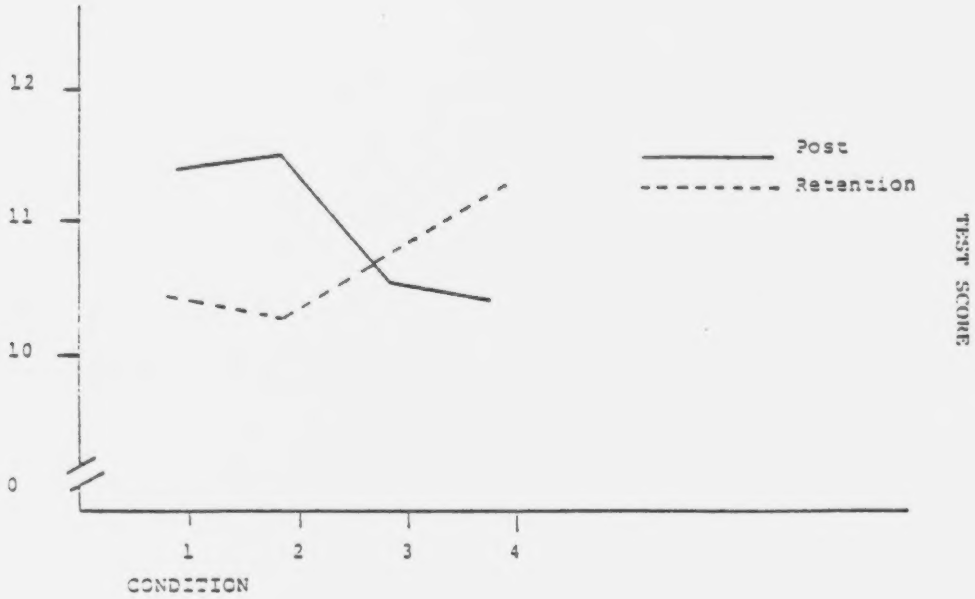
TABLE 6

Means, standard deviations and *t*-tests for comparisons between combined experimental conditions on retention test

CONDITION	N	$\bar{X}$	SD	T	PROB.
1 and 2(Live)	132	10.34	3.6	2.11	.05
3 and 4(Vted)	114	11.27	3.21		
1 and 3(Direct)	136	10.65	3.52	-.60	N.S.
2 and 4(Indirect)	110	10.92	3.46		

Figure 2

Post by retention test interaction



It is evident that during the two week period between actual testing and retention testing the achievement test scores following live lectures have decreased, while those following videotaped instruction remained stable or increased.

The reversal is a novel result and it appears on the first occasion on which we were able to get good uncontaminated retention test measures. The finding should be replicated at the earliest possible opportunity. However, it is likely that in the interval between learning and retention further reading and/or additional rehearsal of the material took place more in some conditions than in others. This may have been because the videotaped conditions generated greater interest in the topic, perhaps through being relatively novel to the students; or it may have been because the videotaped conditions produced less satisfaction with the initial learning situation and consequently greater dissonance.

Perry & Williams (1978), suggest that such a happening is likely. A student who feels dissatisfied with the learning experience may experience dissonance, e.g., liking the instructor, but getting little from the presentation. As a consequence such a student may well go and study the topic further before the retention test. This could, at least in part, account for the reversal in retention score results.

That dissatisfaction with the learning was an important factor may be seen from the attitude test data.

II. Attitude Scale Data:

Table 7 presents the raw data obtained from the analysis of the attitude scales. It shoud be noted that the lower numerical values indicate more positive ratings. Inspection of the mean attitude ratings in each of the four treatment conditions reveals two important points. First, there are significant differences among conditions on almost all of the items on the scale, which, in fact replicates and supports the previous findings using these items, (Baggaley & Duck, 1976; Baggaley, 1978). Second, as is clearly shown, a pattern emerges indicating that conditions 1 and 3 are similar, while conditions 2 and 4 are different from 1 and 3, as well as from each other.

Because of this pattern of significant differences among individual items, factor analysis was carried out to further examine and clarify these differences. Factor analysis using principal factoring with interaction and orthogonal rotation as described by Nie, Hull, Jenkins,

TABLE 7

Means and standard deviations of the semantic differential scales by condition

Attitude Scale	Condition 1 Live N = 97		Condition 2 Live Vted. N = 61		Condition 3 VT - - LL N = 87		Condition 4 Studio N = 65		Significant Comparisons
	X	SD	X	SD	X	SD	X	SD	
1. Confident - Nervous	1.64	1.04	3.07	2.24	1.98	1.27	2.55	1.35	2>1,3; 4>1,3
2. Calm - Agitated	2.05	1.35	2.34	1.63	2.07	1.30	2.79	1.58	4>1,3
3. Warm - Cold	2.23	1.34	3.18	2.04	2.43	1.40	3.28	1.42	2>1,3; 4>1,3
4. Fair - Unfair	1.73	1.24	1.89	1.62	2.03	1.30	2.15	1.19	N. S.
5. Believing - Skeptical	1.59	1.03	3.08	2.44	1.72	0.97	2.19	1.27	2>1,3,4; 4>1
6. Broadminded - Narrow minded	2.11	1.26	2.15	1.42	2.56	1.41	2.68	1.21	4>1
7. Sincere - Insincere	2.14	1.51	3.05	2.31	1.93	1.07	2.65	1.28	2>1,3; 4>1,3
8. Relaxed - Tense	1.94	1.38	3.18	2.23	2.08	1.34	2.89	1.71	2>1,3; 4>1,3
9. Pleasant-Unpleasant	1.66	1.27	1.54	1.13	1.78	1.33	2.08	1.08	N. S.
10. Expert - Inexpert	2.42	1.31	3.28	1.95	2.45	1.14	3.28	1.52	2>1,3; 4>1,3
11. Friendly - Unfriendly	1.63	1.36	2.74	2.40	1.77	1.15	2.19	1.20	2>1, 3, 4
12. Honest - Dishonest	1.64	1.00	1.64	1.17	1.90	1.17	2.23	1.28	4>1, 2
13. Emotional - Unemotional	3.68	1.76	4.12	1.79	3.51	1.75	4.20	1.54	N. S.
14. Stable - Unstable	2.20	1.44	2.97	2.04	2.26	1.33	2.59	1.45	2>1,3
15. Direct - Evasive	1.73	1.08	2.07	1.48	2.17	1.29	2.14	1.13	N. S.
16. Wise - Foolish	2.63	1.56	2.75	1.78	2.46	1.09	2.89	1.16	N. S.
17. Precise - Imprecise	2.12	1.23	1.98	1.28	2.09	1.02	2.45	1.36	N. S.
18. Likable - Unlikable	1.69	1.25	3.10	2.55	1.86	1.29	2.48	1.45	2> 1, 3, 4; 4>1,3
19. Reliable - Unreliable	2.04	1.41	3.03	2.30	2.10	1.11	2.72	1.48	2>1, 3; 4>1,3
20. Strong - Weak	2.27	1.32	2.10	1.31	2.48	1.13	3.03	1.22	4>1, 2, 3

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Steinbrenner & Bent (1975) on the scale for our data yielded three attitude clusters. Table 8 shows the scales that clustered in each attitude, using a factor leading of ± .55 as the criterion for selecting scales in each cluster.

TABLE 8

Scale clusters on attitudes 1, 2, 3, from the attitude scales

Attitude 1 - General Eval.		Attitude 2 - Integrity		Attitude 3 - Intensity	
Description	Loading	Description	Loading	Description	Loading
Confident Nervous	.68	Honest Dishonest	.55	Calm Agitated	.63
Warm - Cold	.65	Direct-Evasive	.55	Fair-Unfair	.64
Believing Skeptical	.74	Precise-Imprecise	.58		
Relaxed-Tense	.66	Strong - Weak	.62		
Expert-Inexpert	.66				
Friendly-Unfriendly	.73				
Stable-Unstable	.60				
Wise-Foolish	.55				
Likeable-Unlikeable	.86				
Reliable-Unreliable	.76				

As can be seen in Table 8, Attitude 1 seems to be a general evaluative factor that emphasizes presonal qualities such as friendliness with students and knowledge of subject. Attitude 2 is essentially an integrity factor (replicating findings of Baggaley, 1978), and Attitude 3 contained only two items which appear to be an intensity factor, since both the scales involved are stronger and more emotion-loading than the others.

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We then examined how these attitude factors varied across the presentation treatments. To do this, a composite mean for all the scales in each cluster was calculated for each subject. The means and standard deviations for each attitude factor across the experimental treatment are presented in Table 9. Multiple comparisons using Newman-Kuels showed a clear superiority of the live condition (1) over the studio condition (4), and for all three attitudes. In addition, on Attitude 1, the general evaluative factor, the live condition (1) received significantly better ratings than all other conditions; ($F = 15.99$, $P < .001$). On Attitude 2, the integrity factor, the live condition was not different from LV (2), or VTLL (3), but all were significantly better than the studio (4) condition. ($F = 2.92$, $P < .04$).

TABLE 9

Adjusted means and standard deviations (after regression) for attitudes 1, 2, 3 by condition

	Condition 1		Condition 2		Condition 3		Condition 4	
	Live		Live V-taped		V-taped live		Studio	
	N 79		N	52	N	73	N	57
Attitude	X	SD	X	SD	X	SD	X	SD
1	1.89	.79	3.14	1.99	2.10	.79	2.70	.85
2	1.96	.86	1.96	.98	2.15	.90	2.48	.78
3	1.88	1.11	2.14	1.48	2.03	1.07	2.48	1.14

The conbined comparisons of live versus videotaped and the direct versus indirect comparisons that were done on the achievement data were also done on the attitude data. These comparisons are presented in Table 10. Attitude 3 was not included in these comparisons since it contained only two items and consequently did not differentiate as dramatically among conditions.

Table 10

a) Means, standard deviations, and
t-tests for combined live
versus
studio conditions on attitudes 1 & 2

	Additude 1 Gen. Eval.				Attitude 2 Integrity		
Condition	N	$\bar{X}$	SD		$\bar{X}$	SD	
1 and 2 Live	158	2.41	1.43	t=.41 NS	1.94	.88	t = -3.50 $p <$ .001
3 and 4 Videotaped	152	2.36	.87		2.29	.86	

b) Means, standard deviations, and
t-tests for direct
versus
indirect conditions on attitudes 1 & 2

Condition	N	$\bar{X}$	SD		$\bar{X}$	SD	
1 and 3 Direct	184	2.05	.78	t=-6.29 $p <$.001	2.05	.36	t = -1.64 NS
2 and 4 Indirect	126	2.36	1.48		2.21	.92	

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It is clear from Table 10 that live presentations were rated as demonstrating significantly more integrity (Attitude 2) than videotaped presentations, although there were no differences between the two on general evaluation (Attitude 1). Conversely, there were no differences between direct and indirect presentations on integrity, but indirect presentations received significantly poorer ratings on the general evaluative factor.

It appears, then, that evaluation depends primarily on contact with students, with anything artifical in the situation reducing evaluation, since it interferes with contact. Integrity, on the other hand, seems to depend primarily on mode, with videotaped performances being seen as demonstrating less integrity than live ones. This may be an important consideration to keep in mind in using videotaped instruction. These findings are consistent with those reported by Baggaley (1976), (1978) and by Baggaley & Duck (1976).

Curiously, the overall evaluation factor appears not to be related to initial learning or to retention. It was hoped that a correlation between achievement and student attitude would emerge, but such was not the case. The integrity dimension, however, does show important parallels with the achievement data. The attitude differences found on integrity are in the same direction as those found on initial learning, but reversed for retention. It may be then that the student who feels he has been tought by someone who is not honest or sincere (i.e., low integrity) feels dissatisfied with instruction, and therefore is more likely to study on his own after the learning session. This would account for the higher retention scores yet lower integrity ratings for the videotaped conditions over the live conditions.

It should be stressed, however, that this teaching-learning dissonance explanation is tentative at best. Only one instructor was used in this design so that only minimal differences would be expected. Moreover, the students in this sample were accustomed to good teaching, and, therefore, expected to be taught well, and were positively inclined toward learning. Replication of this study with a variety of instructors and with other types of students remains to be done. However, the experiment clearly suggests that student responses to videotaped instruction may be less approving than is generally supposed; and that particular attention must be paid to the effects of videotaping methods on teachers' perceived integrity in future.

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ACKNOWLEDGEMENTS

Work on this project was supported in part by Canada Council Grant No. 86-812. Portions of the work were presented at the Second Conference on Experimental Research in Videotaped Instruction and its Practical Implications at Corner Brook, June 1979. The authors also wish to thank Dr. J. Baggaley for helpful comments on the manuscript, and P. Noseworthy and J. Sharpe for material preparation and data collection.

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SOME NOVEL USES OF COLOR TELEVISION IN UNDERGRADUATE CHEMICAL EDUCATION

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ABSTRACT

Instructors in the Undergraduate Chemical Education Department of Ferris State College undertook to make their course material as concise and clear, yet as interesting as possible, without sacrificing the all-important essentials. Instructors experimented with TV quiz show formats for specialized topics and supplemental instruction. Students enrolled in the Science Education Curriculum were invloved in the production of the programs. The paper describes the design and production of the programs, and the general benefits of a novel approach to Chemical Education.

INTRODUCTION

In a paper entitled 'Have We Innovated the Chemistry Teacher Out of the Classroom?', 1973 ACS Award Winner Dr. Robert C. Brasted pointed out a number of purposes educational classroom innovation should accomplish. We heartily support his suggestions in this regard (J. Chem. Educ., 1973) and would add one additional prupose to his list, namely: the motivational aspect, i.e. 'turning students on' to chemistry through the utilization of new techniques of instruction. Our rationale for this addition is as follows.

At many state supported institutions where enrollment patterns determine alloted budgets, an 'open door' policy is currently in operation. Students who might not have attempted college for a variety of reasons are now in the classrooms undergoing a form of identity crises, that of attempting to identify themselves with a particular course of study. More than ever before instructors have the responsibility of making the course material as concise and clear, yet as fun and interesting as possible without sacrificing the all important essentials.

Assuming, then, that this is the emerging role of the teacher at such institutions, we set out to accomplish this enormous task through experimentation with novel utilization of color CCTV for specialized topics and supplemental instruction. To aid us in this task we enlisted the services of half a dozen students enrolled in the Science Education Curriculum in the School of Education at this institution. We felt that the student element was very important for reasons which will be forthcomimg.

Two of the more innovative programs which were written and produced are discussed in detail below.

USING THE TV QUIZ SHOW FORMAT TO REVIEW MECHANISTIC ORGANIC CHEMISTRY

A. THE RATIONALE

The modern approach to the teaching of organic chemistry takes cognizance of the fact that the study of organic chemistry deals primarily with the dozen or so basic organic chemical reaction mechanisms. Intimate knowledge of the details of these mechanisms, coupled with an awareness of the thirty or so functional groups, allows the student of organic chemistry to make predictions regarding a particular reaction he has never seen before by recognizing the reaction type. That is to say, if he looks at two reactants and is able to identify a primary carbon system, recognizes that the carbon atom holds a good leaving group, and further recognizes that the other reactant is a strong base (good nucleophile), he could proudly proclaim that this reaction (that he'd never seen before) would most probably undergo bimolecular substitution at saturated carbon, e.g. SN-2.

He could quickly determine whether the reaction would proceed rapidly or slowly and, in addition, could predict the product and its stereochemistry where pertinent.

A mastery of these basic organic reaction mechanisms is absolutely essential or students fall into the horrible pattern of attempting to memorize reactions. We all know that students love to memorize, and it is hard to bring them to the realization that the study of organic chemistry can be made considerably easier if one masters these basic reaction mechanisms. We felt that every effort should be made to encurage students to do just this and so, while watching CBS's To Tell The Truth one evening on television, the idea was conceived for adapting the television quiz show format to reviewing mechanistic organic chemistry. Our idea was to present the particular mechanistic theory in a lecture of two, then, after a day or so of allowing this to stew in the minds of the students, hold a workshop and review session dealing with the particular mechanistic theory presented previously. Our use of the lecture workshop concept is not new. We presented a paper at the American Chemical Society's 1972 Great Lakes meeting which dealt with the use of color television, a wide variety of color coded models, and television special effects to teach and review stereochemical concepts. At one point, using the special effects capability of our television studio at Ferris State College, we were able to shrink ourselves down to molecular size and point out axial and equatorial bonds and 1,3-di-axial interactions in cyclohexane molecules. Having some experience with color television then, we discussed our television quiz show format idea with our television director who encouraged us to go forward with plans.

B. THE RUDIMENTS

How does one select the panelists, contestants, and moderator for such a production? I felt that from the student's point of view, a panel consisting of fellow students would be, in their opinion, more credible and, further, would provide something for them to identify with. For contestants, I chose my colleagues who have varied responsibilities as chemistry teachers. I decided to cast myself as moderator primarily because I basically enjoy hamming it up and, further, I felt that as originator of the idea and author of the script I was in the best position to oversee the entire operation.

Since none of the students had had any previous exposure to television cameras, I felt that some valuable experience could be gained by producing some 'commercials' which could be aired along with the television quiz show. Over a period of two weeks our group held several two hour brain-storming sessions where we conceived ideas for these commercials which were essentially 'take-offs' of those currently being aired on national television. The main theme of these commercials was that it was a great idea to read the text (we use Morrison & Boyd's Organic Chemistry, 3rd Ed.), study hard, and do the problems consistently.

With the commercials behind us we felt experienced enough to proceed with the plans for the television quiz show. After a number of rehearsals and a great deal of work by the college's audio-visual and graphics personel, who assembled a very colorful and authentic set, we felt ready to go in front of the cameras for the taping of the proposed show.

The 18 minute production which reviewed substitution and elimination reactions at saturated carbon was interspersed with 30 second 'spot commercials'. The show began with the introduction of the moderator and student panel followed by a commercial. Three of my colleagues then entered all claiming to be Karl Otto Walden, the discoverer of the SN-2 inversion reaction mechanism. During the questioning by the student panel, two of the three respondents made subtle errors. When all panel members had asked their questions, the student audience was asked to vote for 'Number One, Number Two or Number Three'. The panelists then indicated their choices, carefully reviewing the reasons for their particualr choice. The 'real Karl Otto Walden' was then identified accompanied by much hoopla.

C. THE RESPONSE

It is very difficult to totally and honestly access the educational value of this unusual means of instruction and we present no data to support our claims. Rather, it is a feeling, an observation, namely: that we have experienced a remarkable interest in the importance of the knowledge of the full details of the basic organic reactions mechanisms presented in this tape. One, however, has to avoid making such a production so entertaining that the educational value is lost.

Viewing is best done in small groups or by individual students (a television viewing area is found in both the independent study center of the college library and a centrally located administration building).

USING AN HISTROICAL VIGNETTE TO REVIEW FUNDAMENTAL ACID-BASE THEORY

('An Afternoon with Professors Arrhenius, Lowry, Bronsted and Lewis')

A. THE RATIONALE

A fundamental knowledge of acids and bases is essential to understanding much of mechanistic organic chemistry. A supreme example of this would be a thorough comprehension of substitution reactions at saturated carbon where identification of a good and poor leaving groups, strong and weak acids and bases, is so very essential. However, before a student can capably identify the above, he must know what an acid or base is and how it behaves in a variety of solvents.

As our students began their study of organic chemistry, it was immediately apparent that, in general, they lacked a good understanding of fundamental acid-base theory. It was to meet this need that we initially wrote the program which we will shortly describe. Although fore-most in our minds was this purpose for review, we found the program to be equally valuable as a lecture supplement for our first level general chemistry courses. In addition, this particular color tape has stimulated interest in developing 'sattelite' tapes dealing with other important aspects of acid-base theory: e.g. 'Acids, Bases, Electrophiles and Nucleophiles' and 'Acids, Bases, Equilibria and pH'.

B. THE RUDIMENTS

The production, which was written and produced while I was on sabbatical leave developing instructional aids, involved four colleagues with varied teaching responsibilities. After I had written a rough draft, I asked my colleagues to respond to the proposed dialogue and, at this point, corrections, substitutions and additions were made for clarity of presentation.

I chose a senior (age 48) member of our staff to play the role of Arrhenius, the granddaddy of acid-base theory. I played the role of Bronsted and my close colleague in organic chemistry played Lowry, complete with typical witty, very British remarks. Professor Lewis, the young and progressive American, was played by the most recent addition to our staff.

After the credits were rolled to musical background (Swedish Rhapsody, which has become the theme song for all our productions), Professor Arrhenius, dressed in late 1800 academic attire, began the histroical sketch in Swedish with dubbed English subtitles, then broke into English. He carefully reviewed his contributions to acid-base theory. Very shortly, Professors Lowry and Bronsted entered, and, after a rather formal introduction, prodeeded to tactfully point out the limitations of the Arrhenius theory. At the same time, they presented examples (which appeared on the television screen) to illustrate their ideas regarding the proper means of considering acids and bases. A little more than half way through the tape, which ran 17 minutes, Professor Lewis came in carrying a paint can and brush. He'd "been going batty in the lab and had been painting black dots on everything in sight." He subtlely attacked the insistence of Lowry and Bronsted to stick with protons donors and acceptors, and suggested a more general approach to acid-base theory with several examples himself. At the conclusion of the tape, Professor Arrhenius carefully and concisely summarized all theories, pointed out the contributions of all present. The suggestion was made to continue discussiosn related to acids and bases at some future date thus leaving an 'open-ended' nature to the production. While Swedish Rhapsody was once again played, the cast credits were rolled.

THE RESPONSE

Student response to this production was overwelmingly supportive both by first year students who viewed the tape as a lecture supplement and by organic chemistry students who saw it as review. Viewing of this tape can be done by individual, small or large group. However, the examples which appeared on the television screen were somewhat difficult to see at long distance when viewing in a large classroom. This problem was simply overcome by synchronous projection of the slides, made for the television production, on a large white screen in front of the dimly lit lecture room while the television tape was being shown.

FURTHER EXPERIMENTATION

One further experimental use of color television dealt with proper methods of study for chemistry courses. It struck us that our 'spot commercials' pointing to the need for day to day study and problem solving were (perhaps) a good idea, but a statement regarding proper methods of study could serve an additional function. As a result, a one minute and thrity-three second statement on proper methods of study was prepared. It was entitled 'The Tortoise and the Hare.... Revisited'. Using background music from Sans Sans 'Carnival of the Animals', Aesop's familiar fable of the race between the tortoise and the hare was retold, using, by analogy, 'students, who fall into two similar groups' e.g. "those, who through persistent, methodical, day to day study and problem solving, win the race to the wire at examination time", and then the "hares, who try to win it all by cramming at the last minute". Students found themselves looking into a mirror which reflected their own particular good or bad study habits.

This program was also written in the Dutch language and viewed by students at the University of Groningen during the author's sabbatical activities at that institution.

SUMMARY

We wish to reemphasize the point made at the beginning of this paper, namely: that it is not our sincere wish that the reader adopt one or more of these unusual instructional techniques. We have attempted to indicate that the use of the mentods described herein were largely determined by our own particualr teaching situation, the type of students, the available facilities, and by our own personal style of teaching. Our particular use of these techniques has been determined by these circumstances and also by our desire to present sound chemical information in new ways that are visually exciting to students. Our hope is to increase their level of retention, make the course more enjoyable, and increase motivation on their part to acquire the best possible knowledge of the subject.

ACKNOWLEDGEMENTS

The author wishes to thank undergraduates Kris Clark, Juliana Eashoo, Renee Fleming, Pat Clark, James Oss and Dennis Reppenhagen for their valuable contribution which made this unusual work a successful experiment. In addition, he wishes to acknowledge Mr. Allan Fickes and Drs. Marvin Lofquist, Olaf Larson and Gary Nash for the important roles they played in the two productions described. Special thanks is given to Mr. Robert Pincumbe, Director of Media Production, at Ferris State College.

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THE EFFECTS OF PLACEMENT, DELIVERY FORMAT AND MISSED CUES ON TV PRESENTER RATINGS

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ABSTRACT

The present paper describes three experiments, one concerned with setting factors (presenter placement on the screen) and two with performer variables (delivery formats and missed cues). In each, a CBC newscaster served as the presenter for a 90 second news story. The material was origional but topical, with the presenter's delivery being supported by four visual background changes appropriate to the theme. The subjects were the equivalent of 1st year university students (average age 18 years) enrolled in English courses.

Results indicate that no apparent advantage to a presenter's image results from either a left or right screen placement. Holding either position constant during a particular sequence or news item, however, produces distinct benefits when compared to a within - sequence cross-cutting format. Secondly, a telepromph delivery does not appear to offer significant advantages in terms of presenter credibility and appeal over a script - reading format. Thirdly, viewers may be prepared to forgive slight errors in a television speaker's delivery, but those more obvious such as a series of missed camera cue may affect not only the perceived structural aspects of his presentation but also his credibility.

INTRODUCTION

Until very recently, the area of production variable research, particularly in television, was relegated to a secondary role in the wake of the drive to satisfy critics that the medium could indeed teach and that it was either as or more effective than either a traditional teacher or other media. The *Sesame Street* studies may be regarded as the bench mark which has lent impetus to the current small but increasingly prolific cadre of researchers examining presentation techniques which might contribute to a more effective use of television. During the mid-seventies, much of this research has derived from Liverpool University (see Baggaley and Duck, 1976; Baggaley, 1980), the Swedish Broadcasting Corporation (e.g., Findahl and Hoijer, 1977) and Concordia University. A number of studies have also emerged from the United States but for the most (with the exception of the C.T.W. portfolio) have been 'one shot' exercises with little or no replication or extension in the majority of cases.

One of the formidable problems in television production and presenter variable research, which is reflected in the incoherent exercises produced during the 50's and 60's, is the complexity of the medium itself and the careful isolation of factors for rigorous analysis. The situation has been and is further complicated by the apparent lack of rationale in general for the use of standardized methods and the seemingly constant affiliation for novelty in techniques used by professional broadcasters. As one attempt to grapple with this haphazard approach, an earlier article surveyed the bulk of published research (Coldevin, 1976) and a later paper set forth a classification of specific categories for analysis (Coldevin, 1979). Figure I is reproduced here as an indication of the types of variables which have been examined with a marshalling of these into appropriate categories by maintaining a clear distinction between production and performer variables.

Production variables as described here are subdivided into 'technical' or 'hardware factors' and 'content organization' or 'soft ware' strategies. Performer variables form a unique category but provision is made for possible interaction with relevant production variables.

The classification is intended to remain open-ended to incorporate new directions and variable analyses as they are forthcoming.

In the foregoing spirit, the present paper describes recently completed studies at Concordia University, one concerned with setting factors (presenter placement on the screen) and two with

FIGURE I

Selected categories for production and performer variable analysis

PRODUCTION VARIABLES

Technical Variation

Camera Factors (Angle & Shot)
Setting
Lighting
Graphic Devices
Audio Factors
Audio-Visual Relationships
Still vs. Motion Pictures
Composition (Space Manipulation)
Special Effects
Color vs. Black & White

Content Organization Strategies

Opening-Closing Format
Simplicity & Complexity of Treatment
Cues & Advance Organizers
Repetition, Reinforcement & Review
Expository Strategy (Lecture, Interview, Discussion)
Pacing & Rythym
Order and Balance of Segments
Activity Eliciting Potential (Overt vs. Covert)

PERFORMER VARIABLES

Dress
Age
Appearance
Mannerisms
Sex
Missed Cues
Eye Contact Levels
Professionalism
Interaction With Relevant Production Variables

performer variables (delivery formats and missed cues). The major emphasis on performer variables was deliberate since the question of who or what makes a good presenter is poorly elaborated in the research literature. Only four studies were located which produced significant differences among the variables being examined, namely body type (endomorph or heavy vs. mesomorph or medium and ectomorph or thin; McCain & Divers, 1973), age and appearance (young straight vs. mature straight and young hip; Coldevin, 1977), sex (male vs. female presenters; Whittaker & Whittaker, 1976) and professionalism (ITV instructor vs. trained communicator; Wardell, 1976).

In conducting the present research a standardized format was used throughout. A professional CBC newsbroadcaster served as the presenter for a ninety second news story concentrating on projected plans for completing the tower and retractable roof for the stadium constructed for the 1976 Olympic games and the possible effects to the stadium if the roof is not installed within a short time period. The material was original but timely, with the presenter's delivery being supported by four visual background changes appropriate to the theme.

In all three experiments the subjects were the equivalent of first year university students (average age of 18 years) enrolled in English courses. Since students were randomly assigned to classes, intact groups were used throughout. The final assignment consisted of twenty subjects for each treatment (all questionnaires randomly reduced to lowest common denominator). The experiments ran consecutively over a two day period.

In describing these studies, it should be stressed that the rationale for each was derived from careful monitoring of current news production techniques (both network and local) used by Canadian and American channels over a one week time period.

EXPERIMENT I: THE EFFECTS OF PERSENTER PLACEMENT (SETTING FACTORS).

The present research follows from two earlier studies which examined the influence of types of visual backgrounds and display strategies on ratings of a news presenter positioned centrally on the screen. In the first, on-site 'location establishment' visuals were displayed in either a full screen or over-the-shoulder corner location (Coldevin, 1978a). In the second, the same display strategies were used for 'symbol establishment' visuals (Coldevin, 1978b). Both studies compared the effectiveness of background visuals versus a plain setting as presenter enhancement factors. The results showed that both types of visuals, irregardless of display strategy, significantly enhanced the speaker's image when compared to a limbo setting. Location establishment visuals, however, are best displayed in a full screen background and symbol establishment pictorials in a corner screen placement. And when both types of visuals are available, a full screen location establishment display is the more compelling of static presentation techniques.

Shortly after these studies took place it was noted that both local and network news presentations 'moved' the anchor reader (or readers) to either a left or right side of the screen whenever visuals were used to complement his or her delivery. Presumably the change was intended to provide more of the visible portion of the screen for background visuals. Interestingly, this placement was quickly replicated on both Canadian and American channels. In addition to either a right or left side placement, it was observed (particularly during local news productions) that at times presenters would be 'jump cut' from one side of the screen to the other simultaneous with background changes during the same news story, or what we refer to here as 'within-sequence cross cutting'. The present study was therefore intended to test the effects of left versus right placement of the presenter and the effectiveness of both strategies versus the within-sequence cross cutting condition.

PROCEDURE

Three versions of the ninety second Olympic stadium roof story were prepared using the same presenter, script and production details. The four visual background changes consisted of two symbol establishment pictorials (rear-screen projected for a corner screen placement) and two location establishment visuals (displayed in full screen). In the first version the presenter was seen in a left screen position, in the second on the right side of the screen and in the third, cut from left to right to left and finally back to right for the closing portion of the item. Each of these cuts was made simultaneously with visual background changes. In the first and second conditions, cuts were also made at the same points as in the third treatment, but the presenter always remained in either a left or right screen position. In the third condition he was viewed as being 'jump cut' from one side to the other with visual background changes.

The three video tapes were shown one to each of three student groups who were subsequently asked to rate their impressions of the presenter on a twenty item seven-point semantic differential scale.

RESULTS

The results of the analyses indicated no significant differences between ratings assigned to the speaker in either the left or right screen placement. These data therefore suggest that a presenter may be perceived as equally effective in either condition; no apparent advantage results when he is seen in a left versus right screen position. When the 'static' placements were compared to the within-sequence cross cutting condition, however, several significant differences were uncovered (Table I). In comparing the left placement with the jump cutting version, the presenter was rated as significantly more pleasant, strong, honest, organized, friendly and professional. A similar trend held for the right positioning versus the cross cutting treatment. In this comparison the presenter in the right screen placement was rated as significantly more pleasant, strong, organized and convincing.

TABLE 1

Selected mean ratings of presenter seen on left side of screen (X), on right side of screen (O) and durning within sequence cross cutting condition (#)

	1 2 3 4 5 6 7		t x vs. o	t x vs. #	t o vs. #
Unpleasant	#-------OX	Pleasant	0.17	3.20*	2.71*
Evasive	#--X--O	Direct	1.06	0.87	1.79
Weak	#------O-X	Strong	0.77	3.30*	2.36*
Obscure	X#O	Clear	0.18	0.64	0.59
Unreliable	#-O-X	Reliable	0.67	1.49	0.97
Uninformed	X#O	Informed	0.17	0.00	0.18
Insecure	#O-X	Confident	0.88	0.50	0.35
Dull	O#--X	Lively	1.33	1.05	0.34
Dishonest	#-O----X	Honest	1.47	2.12*	0.60
Unorganized	#-------X--O	Organized	1.05	2.20*	3.10*
Unfriendly	#----O--X	Friendly	0.94	2.57*	1.57
Insincere	#-O---X	Sincere	1.64	2.01	0.52
Shallow	#--XO	Profound	0.18	0.94	1.14
Amateur	#---O--X	Professional	1.17	2.40*	0.99
Unconvincing	#----XO	Convencing	0.53	1.34	2.25*

*$p < .05$

NOTE: The scales are aligned in a negative to positive direction in this table and those which follow but durning the administration of the instrument were randomly polarized.

The finding of no significant differences between left and right screen placement is consistent with results from a recent American study (Metallinos & Tiemens, 1977) which compared the effects of the two conditions on the perceived weight, importance, prominence, attractiveness and interest of visuals used in a video-taped newscast. The study also produced no clear evidence supporting the use of either treatment in terms of stimulating visual retention. No convincing evidence has thus emerged which might predict an advantage of one version over the other in relation to presenter ratings. The amount of visual retention which might result from each treatment, however, remains unsatisfactorily tested and warrants additional attention (particularly in the light of neurological studies which suggest that the left field is more conducive to presentation of visual information).

Finally, the superiority of both the left and right screen placement versions over the within-sequence cross cutting condition suggests that where the practice exists, it would be discontinued in favour of either a left or right screen positioning for a particular sequence. The use of cut-aways such as field reporting or commercials, however, may be an acceptable practice for cross cutting between sequences. Cross cutting within a sequence appears to be distracting and affects the perceived credibility, appeal and stability of a given presenter. Similar guidelines may apply to educational television.

EXPERIMENT II: SCRIPT VERSUS TELEPROMPT DELIVERY (EYE-CONTACT LEVELS).

The current standard for an anchor presenter's network news delivery is through the use of a teleprompter which allows the speaker to look directly into the lens of the take-camera and accordingly into the eyes of the viewer. This procedure is followed by some local news readers but the older vehicle of 'working from a script' is still very much in evidence as well. Our second study hence examined the rationale for the exclusive use of the teleprompt format in network news by comparing its effectiveness as a presenter enhancement device with a script reading format.

PROCEDURE

Essentially the same procedure, presenter, script and production details were utilized as in the former experiment. The presenter was positioned to the left side of the screen and in one treatment he worked from a script placed on the news desk in front of him and in the other from a teleprompt simulation. In keeping with established average norms in Canadian and American news presentation, the presenter displayed about 70% direct eye contact during the script reading and 95% during the teleprompt simulation.

Similar also to the former procedure, the video-tapes were shown one to each of two student groupings with the scale rating instrument administered after the screenings.

RESULTS

Table 2 indicates the results of the analysis and the surprising lack of significant differences between the two treatments. And where significant differences were found they were in favour of the script treatment (wherein the presenter was rated as significantly more strong and organized than in the teleprompt situation). The rationale for network reliance on a teleprompt delivery is therefore called into question by this study, at least as far as increased presenter credibility and appeal are concerned. Indeed, working with a script appears to provide a more compelling perception of the presenter in that he is seen to be 'working' at his craft rather than merely delivering a monologue. Structure seems to be added to script reading which apparently is not readily discernable in a teleprompt situation.

Whether these results will translate to more effective educational television in view of the available evidence is moot. Westley and Mobius (1960) for example found no significant differences in learning, attention and interest when students were exposed to television speakers displaying high (90%), medium (50%) and low (10%) eye contact levels. Similar results with regard to

TABLE 2

Selected mean ratings of script (X) versus teleprompt (O) news delivery

	1	2	3	4	5	6	7		t
Unpleasant						o--x		Pleasant	1.32
Evasive						xo		Direct	0.37
Weak					o--------x			Strong	3.60*
Obscure						xo		Clear	0.31
Unreliable						ox		Reliable	0.46
Uninformed						o---x		Informed	1.26
Insecure						o---x		Confident	1.47
Dull					xo			Lively	0.34
Dishonest						ox		Honest	0.17
Unorganized						o-----x		Organized	2.17*
Unfriendly						o--x		Friendly	0.92
Insincere						o-x		Sincere	0.69
Unstable						ox		Stable	0.00
Shallow					xo			Profound	0.33
Unconvincing						o---x		Convincing	1.34

$^*p < .05$

learning were recorded by Connelly (1962) in a high versus low eye contact level experiment. These former studies, however, may lend only general background to the present research given the intervening time interval and 'television socialization' of the current generation of students. Further research is necessary before any definitive conclusions can be drawn but this study at least suggests that a critical examination of current news presentation techniques may be in order.

EXPERIMENT III: THE EFFECTS OF MISSED CUES.

The final experiment in this series was derived from a close monitoring of production and delivery errors made by either the technical crew or the news reader. During the observation period, common presenter mistakes noted were slurs in pronunciation, repeated words or phrases, hesitation in responding to an on-camera cue, and for the benefit of this study, looking off to one side of the screen, i.e., a missed cue. Dependent upon the time taken to correct the flaw, the mistake can be attention directing and distract from the content and ultimate impact of the news item. The intriguing questions in this context are, "How obvious does a missed cue have to be before it seriously affects the perceived image of a presenter?", and/or, "Do all missed cues, no matter how obvious or the length of time taken for correction, seriously detract from a presenter's delivery?".

PROCEDURE

In order to test these questions, three treatments were prepared using the same presenter and general production details as the former studies. In this case the speaker was positioned to the left side of the screen and cuts from one camera to another were made simultaneous with the visual background changes. In the first 'flawless' treatment, the presenter made a smooth transition from looking into one take-camera to the next, that is to say, simultaneous with the cut. In the second, or 'missed cues I' version, the presenter made one error during the cut from the first to second segment of the news item and a further mistake during the third to final segment cut. Each of the errors lasted from two to three seconds, long enough to be noticed, but because of the speaker's professional background (and perhaps practice), were smoothly corrected. This treatment was intended to simulate a situation which might occur during any given news broadcast and indeed which is quite common.

The third version or 'missed cues II' was intended to simulate an obvious lack of attention either on the part of the floor director, the vision mixer, the director or the presenter himself - a situation which might occur on an off night. In this case a missed cue was injected during all cuts from one camera to another (three cuts in all corresponding to the four segments of the story). Each of the missed cues lasted about five seconds. The transition from an off to on-camera was again smoothly corrected during a natural break in the delivery e.g., between sentences. The major difference between this and the former missed cues I version was the obvious and repetitive nature of the mistake - and the presenter's oblivion to it until an average interval of five seconds had passed.

Identical to the former studies, each tape was shown to one of three student groups with the rating scales administered after the ninety second screening.

RESULTS

The results shown in Table 3 demonstrate at once the forgiving nature of the audience to 'slight' mistakes but also their harshness in rating those more obvious. The errors appearing in the missed cues II treatment appear to influence not only the structural elements of a presenter's performance such as organization and stability but his perceived credibility as well (knowledgeability and trustworthiness). In contrast, the only point at which the presenter was rated as significantly less effective than his 'flawless production' performance in the missed cues I condition, was in the perceived 'professionalism' of his delivery. And while audiences may be prepared to forgive small errors the

TABLE 3

Selected mean ratings of presenter seen in flawless production (X), in missed cues I condition (O)[a] and in missed cues II (y)[b] Treatment

	1 2 3 4 5 6 7		t x vs. o	t x vs. y
Unpleasant	y-------xo	Pleasant	0.34	2.95*
Evasive	y---------xo	Direct	0.48	3.18*
Weak	y------------o----x	Strong	1.85	6.54*
Obscure	y---------------ox	Clear	1.05	3.83*
Unreliable	y-----------o-x	Reliable	0.60	3.57*
Careless	y-------------------o-x	Careful	0.49	5.79*
Uninformed	y--------xo	Informed	0.75	3.02*
Insecure	y------------o---x	Confident	1.39	4.55*
Dishonest	y---o--x	Honest	1.22	2.65*
Unorganized	y-----------------------------ox	Organized	0.40	7.78*
Unfriendly	y--------ox	Friendly	0.16	3.10*
Insincere	y----o----x	Sincere	1.71	3.27*
Unstable	y--------o--x	Stable	1.00	3.54*
Confusing	y-----------o--x	Straightforward	0.92	4.22*
Amateur	y--------------------o--------x	Professional	2.35*	8.67*
Unconvincing	y------------o--x	Convincing	1.01	5.19*

$^*p < .05$

[a] Missed Cues I refers to the more subtle, quickly corrected, two missed cues treatment.

[b] Missed Cues II refers to the obvious, not readily corrected, three missed cues treatment.

results from the missed cues II case show that the presenter assumes the blame for mistakes made while he is on camera even though he may not necessarily be at fault!

An interesting and useful extension of this study would involve an examination of the effects of the missed cues treatments on instructional television production. The costly toll to the presenter's image in the exaggerated condition noted here for example may also adversely influence attention and subsequent learning as well. In view of the time, effort and costs associated with re-takes, a resolution of the 'seriousness' of common production errors merits further attention.

SUMMARY

While recognizing the tentative nature of the findings, based upon the foregoing studies the following conclusions are offered:

1. No apparent advantage to a presenter's image results from placement in either a left or right screen placement. Holding either position constant during a particular sequence or news item, however, produces distinct benefits when compared to a within-sequence cross cutting format.
2. A teleprompt delivery does not appear to offer significant advantages in terms of presenter credibility and appeal over a script reading format. Indeed, in this study the presenter in the script reading treatment was perceived as significantly more stronger and organized than in the counterpart teleprompt treatment. The data should be further supported with research examining other levels of eye contact, but we can infer that a 70% level is as effective as one approaching maximum directness of 96%.
3. Viewers may be prepared to forgive slight errors in a television speaker's delivery but those more obvious such as a series of missed cues may affect not only the perceived structural aspects of his presentation but credibility as well.

POSTLUDE

This paper, like much of the current generation of production and performer variable research underscores the potentially positive benefits associated with an examination of 'standardized' methods; and perhaps more importantly, the need for a tested rationale prior to introducing new techniques. Intuition and past experience may have been accepted practice in an earlier developmental period of television but are increasingly nonjustifiable given the relative ease in formulation and short turn-around time for analysis in the type of studies described here.

As for research per se, one final point should be restressed. It was noted in the opening portion of this paper that the variables selected for analysis were drawn from current and commonly employed techniques (and mistakes in the case of the missed cues experiment). This deliberate selection is critical if the gulf between research and practice is to be successfully bridged. It is therefore suggested that future efforts in this area should, in as much as is feasible, be of practical significance to planners and producers of a variety of informational and educational programming. If not, a haphazard approach by both groups will neither come to grips with the subtle effects of varied presentation techniques nor seemingly care to.

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PERCEIVING REALITY VIA MASS MEDIA: PEOPLE AND THE NEWS

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ABSTRACT

The comprehension of a television program is a very complex process. To understand it we must take into account the different knowledge and experiences of individual viewers as well as the impact of different presentation modes. In TV news there is a great risk that viewers merely remember isolated details, out of context. The causes and consequences of news events must therefore be emphasized. The paper describes work conducted at the Swedish Broadcasting Corporation's Audience Research Department with regard to this problem. Guidelines for TV news production staff are indicated.

INTRODUCTION

In Sweden there is only one broadcasting corporation - a single monopoly organisation - the Swedish Broadcasting Corporation (Sveriges Radio). It is organized around the principle of broadcasting as a public utility and financed by fees for the possession of receivers. Commercial advertising is not allowed. The legal framework is set by two radio laws - the Radio Act and the Broadcasting Liability Act, an agreement between the state and the broadcasting corporation. Sveriges Radio is in this way an independent organisation. It is not ruled by the government, but is has obligations to fulfill.

Sveriges Radio has also a research department - an Audience and Programme Research Department, where I am working. It is a comparatively big institution with approximately 20 researchers. All research is open and accessible to everyone. The statement of goals formulated for the research department gives it freedom to operate in a wide range of problem areas, but of course there are limits, especially economic limits.

Some of the researchers are working with audience figures and media consumption, others with children - into, for example, violence on TV, eye movements when reading subtitles etc. Others are working with immigrants and their programs, and with sex roles in television programs. There has also been a lot of research into local radio.

In recent years, priority has been given to the informative effects of radio and television, both from a sociological point of view - illustrating information and knowledge gaps between different population groups - and from an experimental psychological viewpoint. Since I am basically a cognitive psychologist, I have mainly been conducting experimental research, especially into news. And that is what I am going to talk about in this paper.

THE COMPREHENSION OF NEWS

Together with Birgitta Höijer, my colleague, I have been working on a long-term project dealing with the comprehension of news. In Sweden, news is required to inform in an adequate manner. It is required to be comprehensible. And that's our starting point.

A lot of research, not only television research, is often a product of scattered approaches which are never tied together. This is, of course, partly owing to economic and organizational problems and also partly due to scientific and theoretical deficiences. We have conducted experiments with fictitious but realistic news programs in which we have tested different ways of presenting the news. We have also, most recently, been closely analysing the daily TV news broadcasts to find out how they are composed (i.e. how the content is structured and how it is presented). Our hope is that the situations we have studied will serve to exemplify the way in which we more generally acquire knowledge and information through television.

We know that even if 100 percent of the population are watching the TV news, they will not have learned much if they have not understood what the news is about. When we are trying to understand what's happening between a television program and its audience, we must consider several things, if possible all at the same time. We must be able to describe in a psychologically relevant way the content of the news. We must also know something about the impact and the effects of different presentation modes and the aspects that are most important. And we must above all know something about the comprehension process and what's happening on the 'news-stage' in the audience minds.

Let us start with the comprehension process. What do we know? We have, for example, reading comprehension and readability. The traditional approach here is empirical but atheoretical. It deals with certain aspects of the problem but entirely neglects others. As a result will its usefulness be severely limited?

There are now about 50 readability formulas (Kintsch & Vipond, 1979). Every formula has a word and sentence variable, and most of them have a predictive value, but only a predictive value. That means that if words and sentences are shortened in a text, comprehension difficulties will not be removed. And there are obviously other variables that are more important for comprehension than word and sentence length.

What light can cognitive psychologists throw upon the issue? For a long time they have been occupied with nonsense syllables and word list, but during recent years there has been a promising change towards more meaningful and realistic settings (Klahr, 1976; Estes, 1978). But there is still a large gap between cognitive theories and the comprehension of television programs. I don't think we can find the answers in the laboratory, like the physicist. We must do empirical and theoretical research in realistic settings, and it looks as if cognitive psychology is slowly, very slowly, moving in that direction.

Let me here quote an upper middle-aged woman with little formal schooling who participated in one of our studies. She said: "It's odd, sitting there watching news on TV. It is as though I somehow wasn't listening, though I'm sitting there listening all the same". This woman was not exceptional. For many people watching television there is a sort of invisible barrier between them and the happenings on the TV screen. The words refer to things beyond the realm of the listeners' knowledge and experiences, and thus the basic preconditions for communication are lacking.

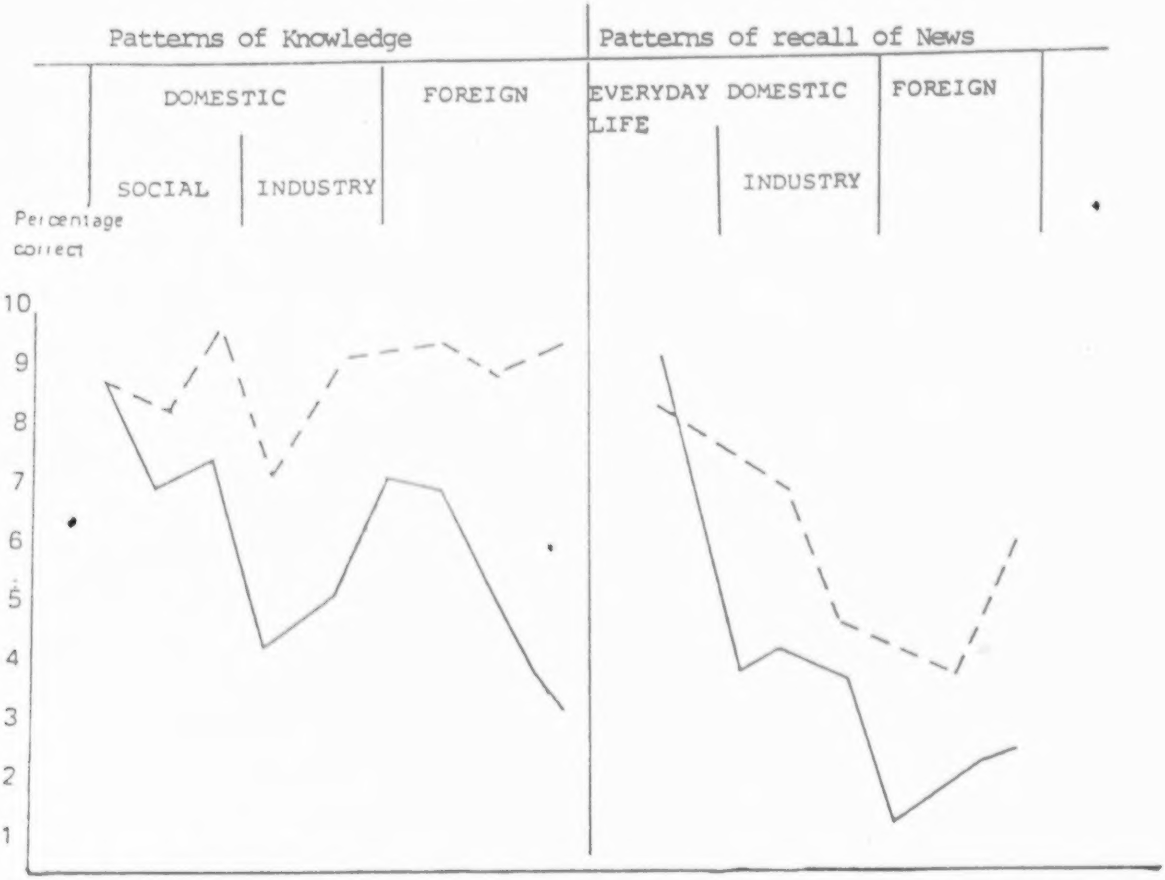
News programs often assume that members of the audience possess the same knowledge as the highly educated middle-aged individuals who produce them. One consequence of this is that a lot of viewers catch only fragments or loose details of the content. Fragmentation is characteristic of the perception of news items. People most easily catch geographical placenames where an event has occurred, and the names of persons and things involved. "Something has happened in Paris" or "Carter said something", but what has happened and what Carter did say is more blurred. More abstract and complex explanations and consequences are often lost.

Another striking factor with respect to the memorability of news is the variation between different items. Some items are easy to remember - nearly everyone recalls them - while only very few viewers recall others. The most easily recalled items are those closely related to everyday life and of direct concern to many people. They are 'close', not necessarily in any geographical sense rather they are psychologically close, in the sense that they are related to people's knowledge and personal experiences.

In one of our studies the participants were taking a knowledge test - a question and answer test of general knowledge on current topics of the sort that is common in media research. They were also shown a fictitious but completely realistic news program and were then asked a series of questions on the program content. The results revealed that the 20% with high general knowledge were able to recall more than twice as much as the 'low knowledge group', despite their being equally attentive to the program.

In Figure 1 we can see the profiles for two distinct groups in the audience, which we have obtained through a Q-segmentation analysis. On one side we have patterns of knowledge, and on the other side patterns of recall. Evidently one of the groups knew a lot about everything, and the difference between the two groups was minimal with respect to Swedish social policy. It increased when the questions were about the labor unions and labor conditions; and the differences were also great in relation to foreign issues.

FIGURE 1

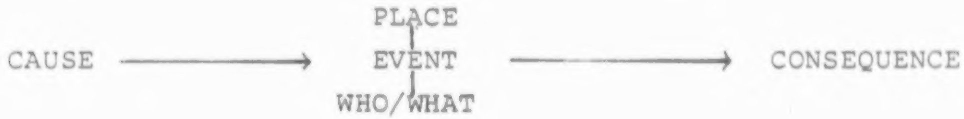


On the other side, where we have the recall patterns for the two groups, we again find great differences, especially for news items about Swedish industry and their labor market, and for news about Latin America and Eastern Europe and a summit conference. But we can also find a difference in the other direction for those items of dealing with everyday-life subjects, postal rates, maternity insurance, etc. Possession of previous knowledge on a subject is apparently no guarantee that all information in the news will be absorbed. But poor knowledge is almost always related to a failure to absorb very much of the program content.

What kind of persons are characterizing these groups? In one group there are many middle-aged men with college education. And in the other group there are many women, both young and elderly, with elementary-school education, none with college education. Apparently the news is made for the first of these groups only.

I have been referring to measures of recall and comprehension as though they were unproblematic. But they are not. We have conducted a lot of methodological research with regard to recall and recognition measurement, for it is important to ask what the questions posed should be about. This brings me to my second point - the content and the content structure of news. How can we find out what is important in a program? What is most essential for us to understand and recall?

THE ELEMENTS OF NEWS CONTENT



News are about events. Events that have recently occurred. We can say that events are a fundamental part of every news item. But there are other parts - for example, the places in which the events take place, the persons and things involved. There is a background to the event - something that has caused the event; and there are consequences. This schema is very simple, but it has - as far as we can see - a psychological relevance. And most news can be analysed according to this schema, even if most content structures are more complicated than this. There is usually more than one event involved. The causal factors may be many and complex, and the consequences are not always known.

Taking this schematic structure of news as our point of departure it seems natural to ask four basic questions with regard to the news items that we have tested: Where? Who/What? Why? With wat effect? Later in the paper I shall demonstrate how we have applied these questions in attempts to understand the very complex structures of different news items.

But it is also necessary to distinguish between what is said in a news program and what is actually communicated. Sometimes, though a lot of facts may be mentioned in a news item, nothing or only fragments are made known to the public. We have already been talking about the importance of prior knowledge in this respect, but we must also consider how the news is presented. And this is our third major point.

A German researcher, Karten Renchstorf, who has also worked with news, has reported findings very similar to the recall patterns that I showed earlier. He analysed two fictitious TV news programs and the amounts people could recall of the news items. He calculated the importance of different presentation modes and suggested that presentation explained 5% of the variance, and the topic (the verbal content of news) explained 25%. He proposes that in order to make news more comprehensible, events close to experiences of everyday life and events more meaningful for ordinary viewers.

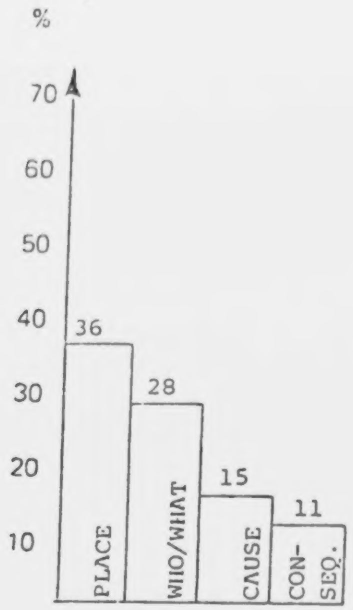
In a way this is right, but the results of our own experiments show that it is possible to make even difficult and remote news comprehensible for the public, if it is presented in an accurate way. The experiments also show that it is not so easy to separate form and content. Content, from the point of the viewer, is inseparable from the form in which it is presented.

When one changes the verbal composition or the visual components of a news item, the content too, as it is perceived by the audience, is altered. Thus the form of presentation has a great influence on viewers' ability to absorb and comprehend the knowledge communicated to them via the news.

Our own study centres around a fictitious, but realistic news program. We recorded 27 versions of the program. They were exactly identical, save for the manner in which five of the items in the program were presented. I will not give further details about the design here except for emphasizing that we were especially careful to make the experimental materials comparable. The results were as follows. I refer first to the audience recall of a news item presented in brief with no other visual illustration than the on-camera newscaster. (Figure 2)

FIGURE 2

Audience recall of information: newscaster only presented

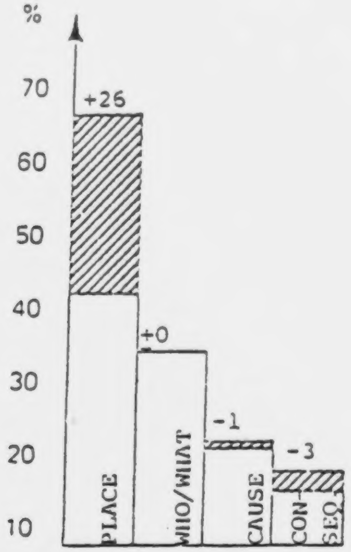


36 percent of the viewers recalled the place where the events occurred. 28% remembered who/what were involved. 15% could recall why the event occurred, while only 11% recalled it's immediate consequences. The more concrete content of the news is often central in people's recollection, as we can see, while other more abstract or complex relations do not register nearly as well. This is a major problem since understanding of the background of an event is often necessary as an aid to linking the details of an event together.

What happens when we are using pictures and illustrations in presenting the news? Let us add to the news item a map with captions indicating the locations of the event. As Figure 3 indicates, many more viewers in this condition recalled where the event occurred, but the other parts have been thrust even further into the background. Not only maps, but also pictures of places and more of less well-known persons often result in viewers being able to recall these things only, while few can recall the casual relations which are making the news understandable. When the persons and things involved are placed in a proper milieu or in the scene of the event, viewers recall is more complete. Such illustrations provide cues to several other elements of the content, and they may also serve as a background to the verbal message, placing the event in the 'here and now'.

FIGURE 3

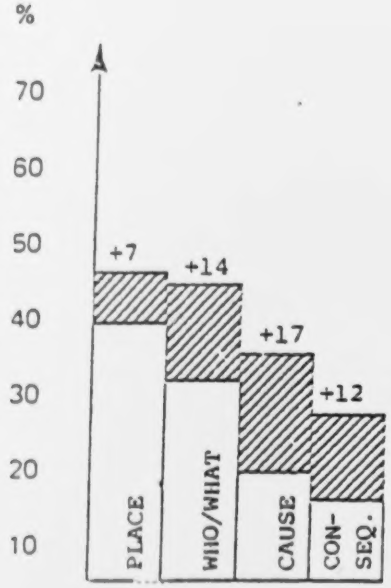
Audience recall of information: map presented



Let us take another illustration, a still photo of 'what happened then' - that is, the consequence of the event. In this case (Figure 4) viewers' recall is improved with respect not only to what the photo illustrates, but to the whole item. Viewers' mental image of the news item no longer consists of isolated details, though an imbalance is still apparent.

FIGURE 4

Audience recall of information: consequence - photo presented

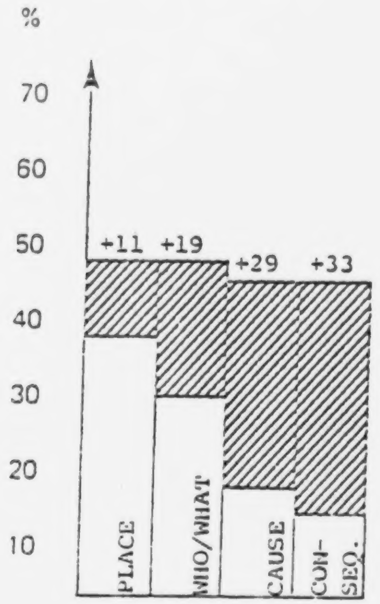


But we can complement the consequence-photo with a verbal repetition in the text, of the cause and the consequence, and the result is as shown in Figure 5. As we can see, both visual illustrations and verbal repetitions can improve audience recall. In individual cases these improvements can be as great as several hundred percent - that is, several times more viewers recall the item when it is presented with visual illustration and/or repetition, than when it is presented in brief by the on-camera newcaster. In the case of an actual news program this may mean hundreds of thousands of viewers. On average, the visual illustrations brought about improvements of roughly 50%, and recall was improved nearly as much when the cause and consequence of the event was repeated in the text.

Another finding from our experiments is that the crucial point is not the picture style. We compared drawings, still photos, superimposed captions and verbal repetitions. It was shown that the technique used was not the determining factor. They all produced the same result: as long as the causes and consequences of news are emphasized, one can choose freely between a drawing, a photo or whatever in order to get the message across. The content of the visual or the verbal repetition is the important thing.

FIGURE 5

Audience recall of information: consequence - photo presented
+ cause and consequence repeated



SUMMARY

In our experiments we were not out to determine the best way of presenting news bulletins. Rather, our aim was to see what happens when news is systematically presented in a variety of ways.

In the world of news events is it, above all, the causal relations that tie the different pieces of information together, and give it a meaning. The causes and consequences must, therefore, be emphasizied, otherwise there is a great risk that the viewers will merely remember isolated details, out of context. Verbally, in the text, you must give the background and mention the effects or the eventual effects of the event. You must place the news in a context.

The visual illustration is more difficult. It is not always easy to find the right pictures and films, but it is important to try to illustrate causes and consequences of the item wherever possible. If the right photo or film cannot be found, a drawing or superimposed captions may be used. The important thing is to counteract fragmentation, and to emphasize the background and relationships relevant to the news events. Thus the public is provided with a context and a framework which can give news events meaning.

I hope that I have shown that the comprehension process of a television program is a very complex process. To understand it, we must take into account the different content and functions of different news items. We must consider people with different knowledge and experiences as well as the impact of different presentation modes. As we have seen, it is not easy to present the news so that the causes and the consequences are always apparent to the viewers. Many conflicting factors are at play. But it is not impossible. Indeed, it is entirely possible to make world events and issues comprehensible. TV can be a medium for information.

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CAN EFFECTIVENESS OF TELEVISED INSTRUCTION BE IMPROVED BY CONTROLLING PRODUCTION VARIABLES?

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ABSTRACT

It is common to hear complaints that one instructional programme was boring, another interesting. If instructional materials are to teach, they must first induce or reinforce looking and listening. A programme that induces more attention than another, is a more effective instructional system (other factors, e.g. content, being equal). How can we design instructional programmes which both promote viewing/listening and communicate knowledge?

Interest in, or attention to, instructional materials involves a sustained relation between the person and the material (or information). Both programme content and production techniques might control attention. But how can the effects of individual programme elements be isolated in practice?

A laboratory procedure is described which enables us to investigate moment-to-moment fluctuations in attention (using TV viewing behaviour as the exemplar) and to relate attention to both the content and the production techniques used in the programme segments. The viewer sits before a TV receiver which has been modified so that the brightness of the screen is controlled by his viewing behaviour. Each press of a microswitch held in his hand produces a momentary increase in brightness; this defines a viewing response. Lack of responding produces a blank screen within a second or so (depending on original brightness). A steady rate of responding maintains regular brightness. A graphic cumulative record is made of viewing behaviour.

Analysis of viewing records can reveal programme segments which do not maintain students' interests. Causal relationships can be identified between individual components of the programme and

their effects on post-tests.

INTRODUCTION

It is common knowledge, if not experience, that people watch entertaining TV programmes even when there is something better to do. This involvement is believed to be less common with 'educational' TV. Content differences notwithstanding, production techniques may contribute to this.

Unlike commercial television, where new production techniques and formats are introduced to attract viewers' attention, educational TV changes little and relies on slower pacing. Yet short, fast programme segments; strobe lights; amplified guitars; and long sequences of fast stills commonly are viewed by young people who then may find ETV boring. Whether such techniques can, or ought to, be used in ETV is a moot point.

ETV, compared with its entertainment counterpart, is more concerned with attitude change, motivating viewers to read textual material and promoting the growth of knowledge. Whether and when techniques used in entertainment TV are compatible with these aims is an important area for research.

Though producers of educational television materials often talk about the entertainment aspect of their work (e.g. "Sesame Street is intended to entertain as well as to educate.") it is difficult to discern exactly what is meant. If entertainment implies not simply to amuse but to engage the attention of people then any communication (which must engage attention of the intended recipient) might be called entertainment. What can we learn about instructional communications by analyzing the manner of presentation of professional entertainment? Is it possible to examine TV programmes that capture attention in order to discover critical factors that might be used to design instructional communications?

HOW EFFECTIVE ARE INSTRUCTIONAL MATERIALS IN ATTRACTING AND MAINTAINING STUDENTS' INTEREST?

An important question is seldom asked, much less answered by researchers on instructional design, viz. To what extent will this instructional material (e.g. TV program, booklet) interest the student in a non-institutional situation, i.e. where he is free to look at any page or book or TV channel--or, equally, to ignore the instructional material?

It is common to hear students complain that one book, CAL lesson or television programme was 'boring' and another was 'interesting'. Can 'boredom' or 'interest' be operationally defined? Is instructional effectiveness related to interest? If educational materials are to teach, they must first induce looking and/or listening. If one version of a lesson induces more attention than another, then it should be more effective.

Intuitively, we use the concept of 'interest' to reflect the extent to which a person engaged in some form of sustained interplay with the subject matter presented by print or other media. Thus the theoretical notion of high interest in the subject or, more appropriately, information stream, implies a relatively high probability of choosing or continuing to view or listen to the stored knowledge once the interaction is established. Conversely, low interest implies a low probability of selecting or continuing to attend to the subject matter.

Without high interest in (i.e. selecting and paying relatively continuous attention to) the messages printed, the efficacy of instructional communications is questionable regardless of test results under controlled study. Interest in, or attention to, instructional materials involves a sustained relation between the person and the material (or information contained therein). Both content and presentation techniques or format might control attention. However these change throughout the lesson. How can the effects of individual program elements be isolated for research? Is there a causal relationship between attention to individual components of an instructional programme and learning?

Most studies of ETV examine post-viewing scores on tests of recognition or recall. Further they rely on aggregate data from many viewers. Typically there is considerable variance in the level of individual student achievement. To what extent can these individual differences be explained by differences in attention to, or interest in, the instructional communications? Expressed otherwise, if the viewer does not observe information pertinent to post-viewing test items then that could explain why his score is lower than it otherwise might have been. It could also help to explain confusing reports about the instructional effectiveness of 'television'.

Another complicating factor in ETV evaluation studies is that identical composite scores on a post-test do not imply shared knowledge about identical segments of the programme. Different viewers may selectively recall different portions of a programme. Such aggregate scores may be useful for predicting class performance but they shed little light on the underlying dynamics of learning from watching television.

CONJUGATE ANALYSIS OF ATTENTION TO COMMUNICATIONS

Is there any method available to the educational technologist for pretesting instructional material under non-compulsory conditions, one which might yield data on the student's interest in the subject matter as presented--preferably on a dynamic (i.e. moment-by-moment) basis rather than only retrospectively by interview or post-test?

In the Educational Technology Laboratory at Concordia University we have established just such a procedure. It provides a continuous and precise recording of a person's attention to (i.e. interest in) a sequence of mediated instructional communications. This technique can supplement or replace other attempts to measure interest or attention (e.g. subjective reports, unobserved monitoring of time spent attending to stimulus, monitoring of time spent looking at a distracting stimulus, physiological measures of arousal).

A key research problem concerns the isolation of individual elements in a lesson and their effects on students' capability. Using television as an exemplary case we have established a laboratory for monitoring moment-to-moment variations in viewing behaviour (as an operational definition of attention to, or interest in, the instructional messages). We are beginning to extend this research to slide/tape presentations and plan to analyze Computer Aided Learning and textual materials using conjugate analysis procedures.

Conjugate reinforcement procedures differ from standard operant reinforcement which usually provides a discrete event (e.g. candy, new stimulus) contingent upon some action. Instead, the contingent 'stimulus' is continuously available (e.g. a TV programme). In conjugate reinforcement the person's behaviour controls directly and immediately the intensity of the stimulus. To illustrate, at a noisy cocktail party one can attend to another person's speech and ignore extraneous information or noise. Yet one can shift attention easily. By definition, the other person's speech (or content thereof) serves to reinforce attending behaviour. Similarly, attending to a TV screen may be reinforced by its content (cf. Lindsley, 1962).

This dynamic (as contrasted with the usual static) reinforcement procedure is highly sensitive to moment-by-moment fluctuations in the person's behaviour because the stimulus intensity is controlled by the person's rate of responding. Thus it is especially valuable for examining the reinforcing value of continuous or narrative stimuli such as a symphony, TV programme or other information which cannot be broken into discrete segments for episodic presentation because this would violate the nature of the narrative stimulus itself. (Imagine attempting to use e.g. a five-second burst of Beethoven's violin concerto or a few seconds of TV news as a reinforcer!)

The technique of conjugately programmed reinforcement satisfies many criteria; it provides efficient, automatic and precise recording of behaviour and an operational definition of interest. By making the contingent stimulus continuously available, where the intensity of this stimulus varies directly and immediately with the rate of response, conjugate analysis provides a direct, immediate and fine-grained analysis of moment-to-moment changes in the reinforcing value of the contingent stimulus.

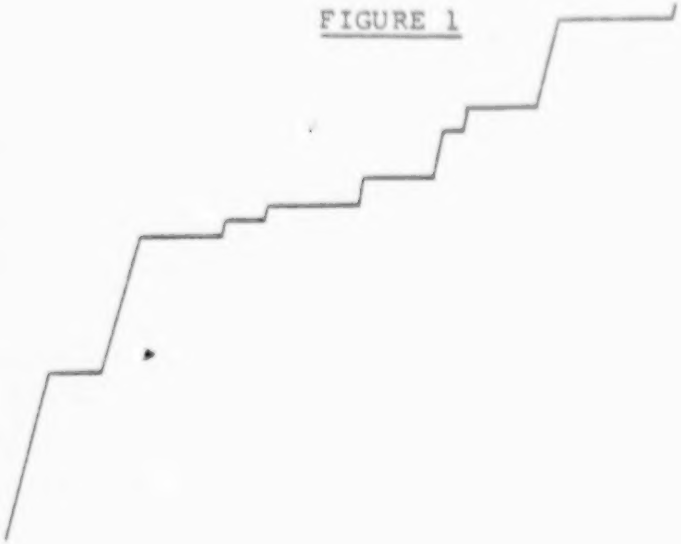
A response is defined functionally. Pressing a sequence of keys on a typewriter may be considered as typing a word, not simply as so many keys pressed. Similarly, if pressing a microswitch illuminates a TV screen momentarily, it is a television-viewing response. A record of this provides a measure of attention and an operational definition of interest.

In our lab the viewer sits before a TV receiver which has been modified so that the brightness of the screen is controlled by his viewing behaviour (which is defined functionally). Each press of a microswitch held in his hand produces a momentary increase in brightness; this defines a viewing response. Lack of responding produces a blank screen within a second or two, depending on original brightness. A steady rate of responding (which becomes as automatic as eye movements after a few minutes) maintains regular brightness. A cumulative record is made of this viewing behaviour automatically. The degree of resolution of the graph is less than five seconds. We also use counters and printing counters. Thus we can relate isolated events in a TV programme to viewing behaviour. (This technique was developed by Lindsley (1962) who used it to study the effectiveness of commercial message.)

Figure 1 shows a record of a person 'watching' an ETV programme. Non-viewing produces a horizontal trace on the cumulative record whereas viewing is represented by a sloping line. Notice that for this person it is little more than a radio programme. If it were found that many persons yield a similar record we would recommend to the producer that the programme be revised before dissemination.

Cumulative record of viewing behavior of person 'watching' an ETV programme

FIGURE 1



CYBERNETIC TELEVISION PRODUCTION

Using current response stations, the feedback loop to the educational materials producer must be provided by the researcher. This delay can be eliminated if several stations are yoked together and fed directly from the TV studio during a production. The average viewing behaviour would be displayed to the producer who could try different presentations formats, etc. if attention is decreasing. Such cybernetic TV production remains untested. Initial results are most encouraging. For instance, using the method to be described, our investigation of ETV aims not only to provide basic research into educational communications but also to provide feedback to the ETV producer. We now operate with time delay but anticipate a real-time cybernetic system which provides the producer with a visual display indicating the extent to which a sample of viewers is interested in the programme being recorded. Thus he can attempt to regulate output (attention-elicitation), not simply inputs, during the production.

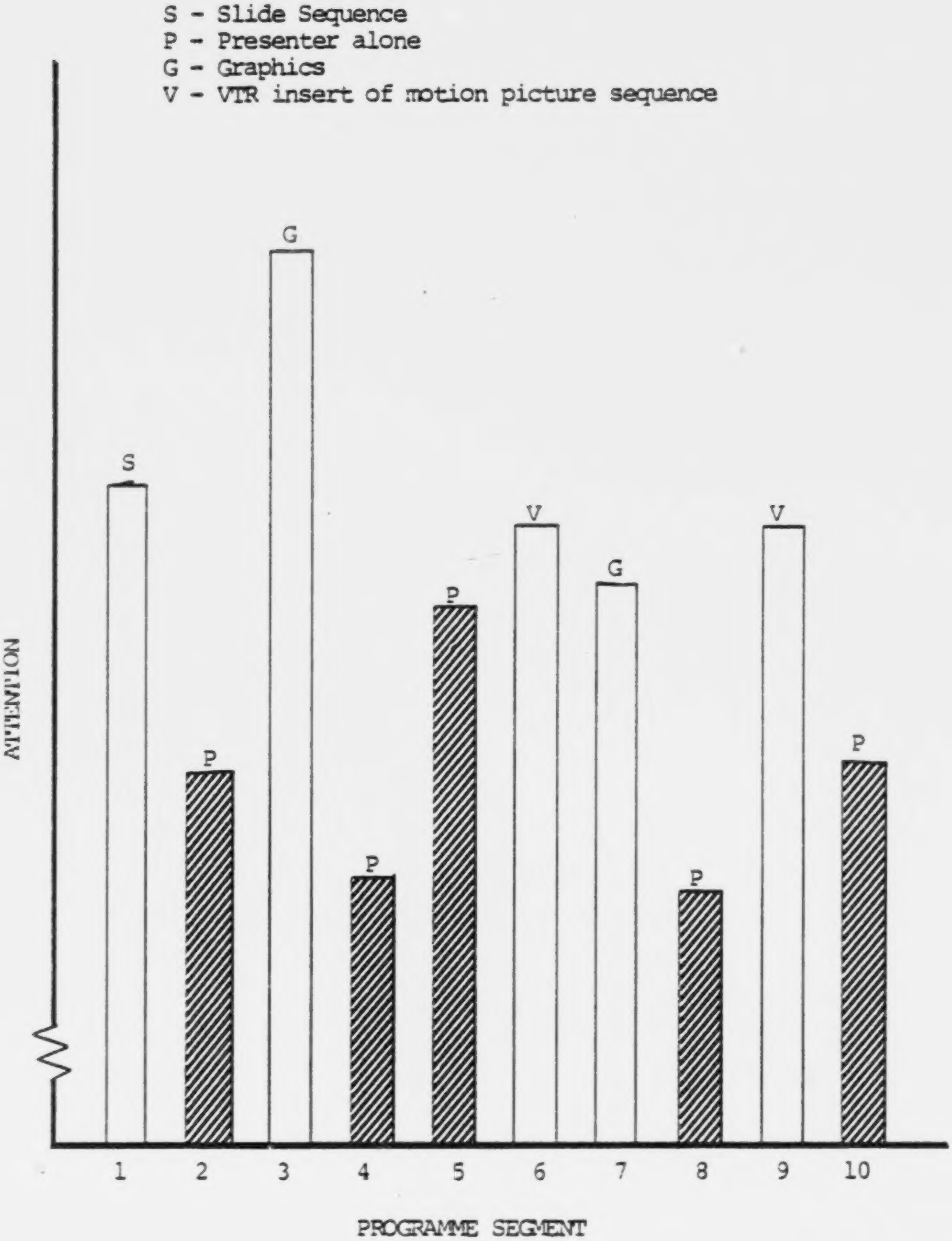
We have produced and analyzed three versions of an instructional TV programme. They have a common audio track but different video tracks. One consists solely of a presenter (intended as a baseline for comparison). The others contain mixed video segments: presenter; motion picture film footage; slides; or graphics (including simple movement of a pointer or cut-outs). Ten instructional concepts were presented either by presenter alone (simple video) in one mixed version or by complex video (film or slides or graphics).

In each of the ten programme blocks attention was higher for the complex version of the video presentation. Comparing mean attention scores for all simple video blocks with complex video, the latter produced 19% more viewing behaviour ($p < .01$), graphics segments being most attention-provoking (see Figure 2). Mean scores averaged over several lengthy video segments obscure many interesting details. Individual differences were common (*cf.* Shears, 1978). Note that attention rises and falls as production techniques change.

Figure 3 shows a cumulative record typical of many 'viewers' of a mixed video programme (a horizontal line indicates non-viewing and slope is a function of viewing rate. The vertical line is a trace left by the pen as it re-cycled from the top to the bottom of the page). Notice that the second half of the programme began with a graphics shot and viewing rate was high throughout most of this shot, fading near the end and then recovering. With the next shot, the presenter, visual attention dropped to zero except for a short burst for a few seconds. The onset of a motion picture sequence produced a high viewing rate until the presenter appeared again. Such behaviour is not unexpected; it underscores our intention to refine methods of instructional design so that attention is maintained even if visually uninteresting material must be presented. (Preliminary results

FIGURE 2

Plot of attention vs. programme segment in an ETV programme



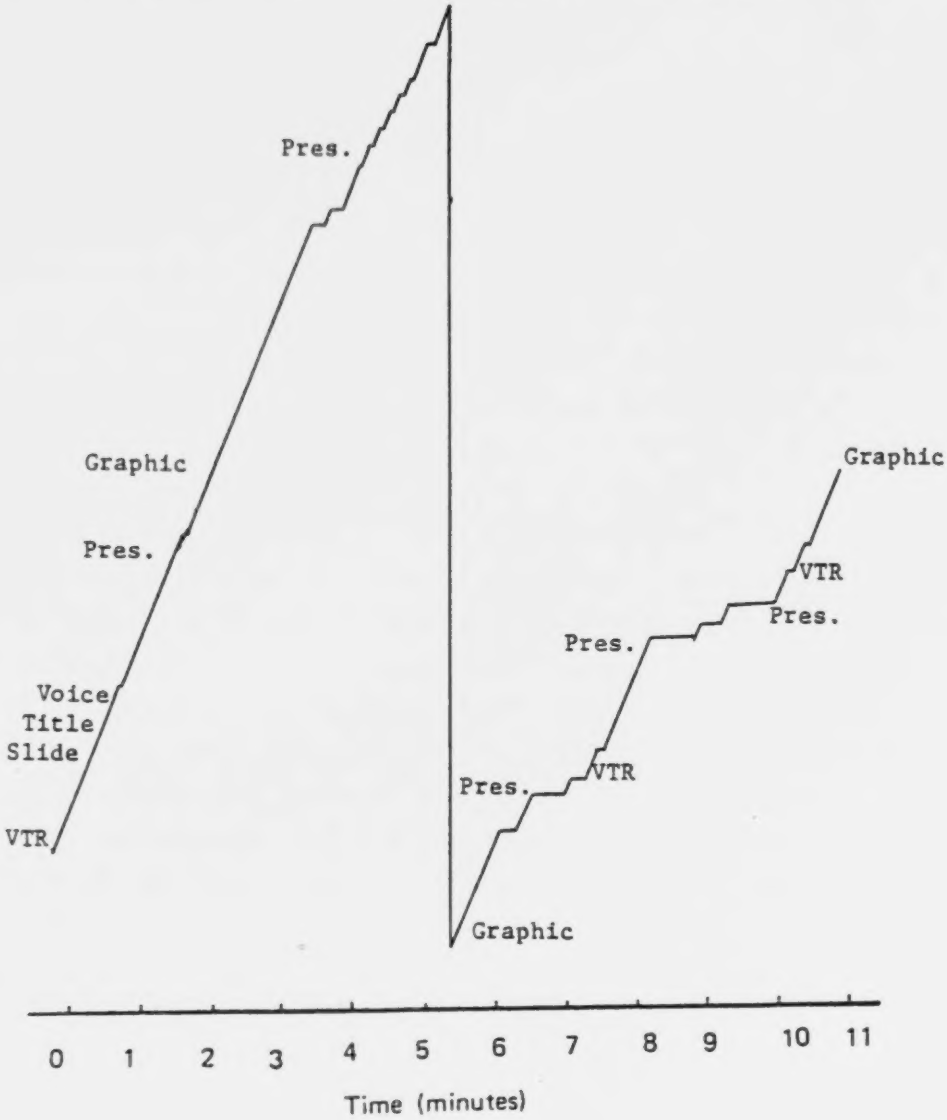
Legend:

S - Slide Sequence
P - Presenter alone
G - Graphics
V - VTR insert of motion picture sequence

suggest that a 'talking head' will be watched more if the shot is not held constant but e.g. switched from one camera to another or from long shot to close up: cf. Figure 2, programme segments 4 and 5). Less readily explained is the fact that Figure 3 shows that the presenter was watched fairly consistently during the first half of the programme. It may be linked to audio cues.

FIGURE 3

How one person viewed the programme 'Forest Fires'



PRODUCTION TECHNIQUES

Inspection of cumulative records reveals frequent cue effects. To illustrate, non-viewing persons responded after hearing such phrases as: "next year the forest may not be there"; "sometimes forest rangers set fires"; "....out of control"; "advantages of controlled fires"; and also after a pause in the audio track. Future research will investigate the interaction between attention to audio and video channels.

It is commonly assumed that motion pictures and television can maintain viewers' arousal and interest to some desired level by changing the stimulus frequently (by cutting from one shot to another and using montages of several shots to assemble a larger view). Figure 4 shows the relative effects of the different techniques used in these three versions. The low resolution display of the TV screen limits the amount of information that can be presented before attention diminishes. Perhaps this analytic tool can help us determine the cutting rate that maintains an acceptable level of attention to the visual display. Armed with laboratory-mediated feedback a highly developed programming strategy might be identified, one which integrates a variety of techniques for singling out details, making transitions, showing transformations of system, etc.

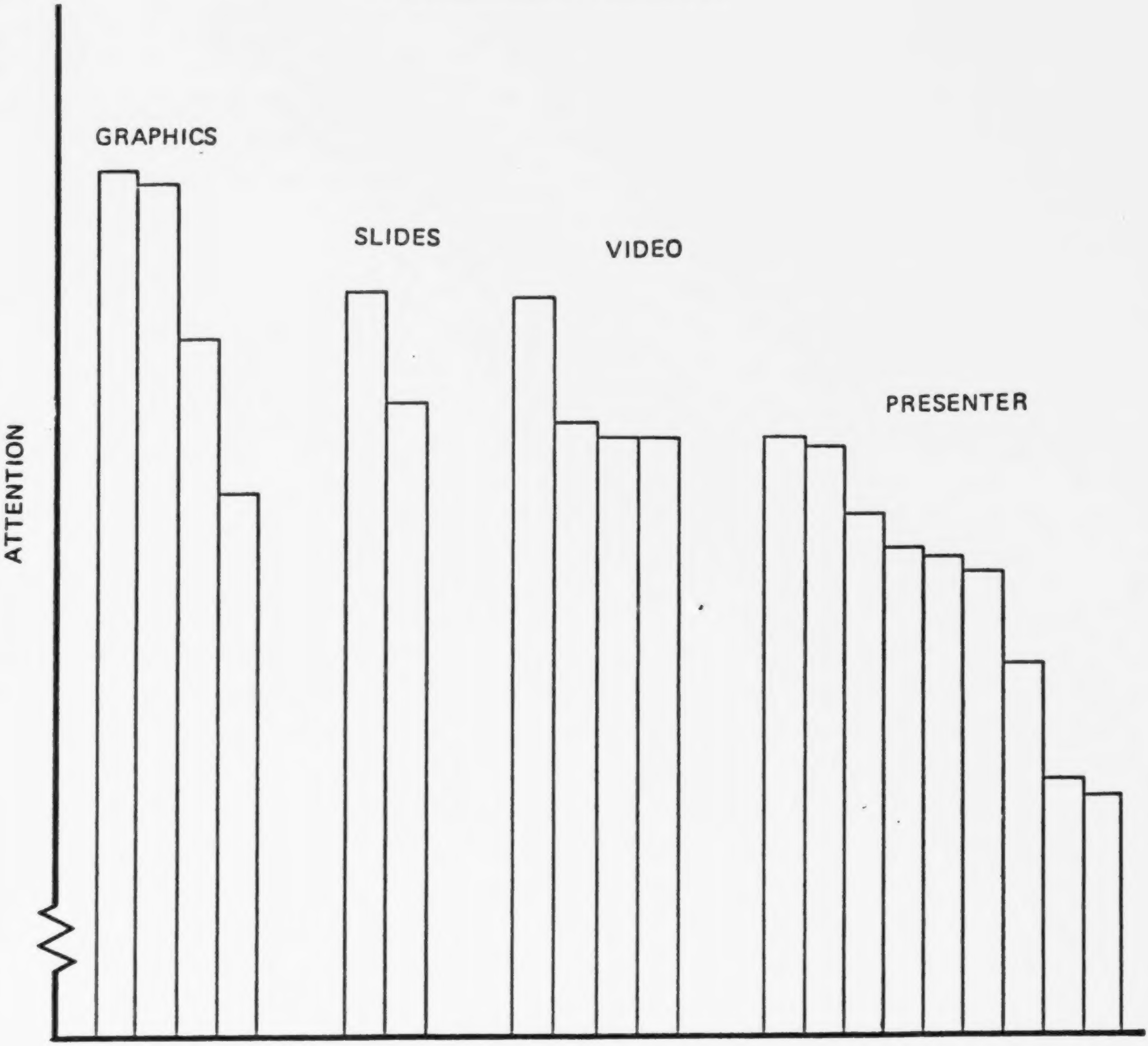
Using this feedback controlled instructional design procedure, the producer of educational TV should be able to learn how to produce effective programmes more readily than without it. Concordia University's Graduate Programme in Educational Technology includes courses in the production and evaluation of ETV materials. It is anticipated that this procedure will be used by students of ETV to develop relevant skills. In principle it could be used to analyse other instructional materials.

We are beginning to use conjugate analysis as a means to determine the best pacing to use in slide/tape presentations. In addition it can detect slides which are not especially interesting to viewers or, conversely, slides which induce much viewing.

The technique can be adapted to the analysis of textual material provided the latter can be presented under experimentally defined conditions (e.g. as a sequence of slides, or using a TV camera

FIGURE 4

TV production technique



which scans the material). We plan to design studies to determine its effectiveness in this area.

Many investigators have reaffirmed and elaborated the basic notion that people can recall some information presented by a TV programme. Typically there is considerable variance in the level of individual student achievement. To what extent can these individual differences be explained by differences in attention to the precise segments of the programme which contain the information needed? If the viewer does not attend to information pertinent to post-viewing test items then that could explain why his score is lower than it otherwise might have been. Current research is investigating this question.

CONCLUSION

Instructional design practice does not always meet the minimum standards assumed by writers of texts on the subject. But even the latter rely frequently on one-shot analysis of the overall effectiveness of relatively large-scale instructional products (albeit with revision and retesting). Such input-output analysis provides no insight into the cybernetics of cognition and learning. It does not even suggest that would happen if different decisions had been made, e.g. about production techniques. It is really a static model of a continuing dynamic equilibrium process which we wish to regulate. Nor does it allow the scriptwriter *qua* instructional designer readily to develop knowledge of how to design instructional TV. We conclude that more and tighter feedback loops are needed to improve instructional design and instruction especially that which involves TV. Further we have outlined an attempt to conduct basic and applied research on the instructional design process as applied to ETV. This appears to be useful not only to improve instructional design theory directly but also to help trainees or practitioners to develop knowledge pertinent to the task of instructional design and evaluation, knowledge not readily attainable without experiencing the feedback processes provided.

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ACKNOWLEDGEMENTS

Both the assistance of Arthur Shears and the assistance of a grant from the Quebec Minister of Education's Programme de Formation des chercheurs et d'action concertée are gratefully acknowledged.

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THE FORMATIVE EVALUATION OF INSTRUCTIONAL TELEVISION PROGRAMMING USING THE PROGRAM EVALUATION ANALYSIS COMPUTER (PEAC)

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THE FORMATIVE EVALUATION OF INSTRUCTIONAL TELEVISION PROGRAMMING USING THE PROGRAM EVALUATION ANALYSIS COMPUTER (PEAC)

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INTRODUCTION

A major impediment to the broad development of effective instructional television programming over the past ten years has been the failure of the field to develop, in association with improved production and instructional techniques, improved formative evaluation techniques which are sufficiently time and cost efficient to be applied broadly throughout the industry. Formative evaluation is that process whereby information representing feedback from members of the potential target audience is acquired during the production process to help shape the program into its most effective form. The benefits of such evaluation at all stages of the production process are well documented.

Many of the formative evaluation techniques borrowed or developed for use on national instructional television projects successfully meet the time restrictions of the production process but are beyond the accessibility, in a cost sense, of all except a few agencies. This is because the evaluation process must adhere to the time restrictions of the production process.

THE PROGRAM EVALUATION ANALYSIS COMPUTER

There is a need for research tools which would enable most agencies producing instructional television programming to incorporate formative evaluation broadly into their production process. One such tool was recently commissioned for development jointly by the Ontario Educational Communications Authority in Canada and the Children's Television Workshop. This device, the Program Evaluation Analysis Computer (PEAC), is capable of replacing several previously time consuming and costly formative evaluation methodologies.

The initial objective was to create a significantly improved version of the traditional program analyzer. The concept evolved into a portable, wireless microcomputer-based instrument capable of recording moment-to-moment reactions to television programming (or any other controlled presentation) by large groups of subjects, including children, as they view. The analyzer is a totally portable testing device that produces data directly related to moment-to-moment program content, immediately. It also replaces the written evaluation report with a series of visual colour graphic data outputs meaningful to both production and management staff.

Components of PEAC

The PEAC consists of 40 or more response units and a central microcomputer with peripherals. Data is displayed on a video monitor as the precoded videotape program is being played. A printer provides a paper copy of all visuals and statistical analyses.

The basis of the data collection process is a response unit approximately the size and shape of a hand-held calculator. These battery-powered units are stored in a suitcase through which they are periodically recharged. The units are initially pre-programmed by the computer through this case. Their data is accessed by the computer following testing in the same manner.

Aside from the equipment necessary to create the visual stimulus to be evaluated (e.g., videotape or film projection equipment), this airflight case with contents is the only equipment required to collect data in the field. In the event that sequential data collection sessions are planned however, the portable microcomputer unit is also able to store data between sessions.

Each of the data collection units has sixteen response keys which can be covered with various templates, such that any number of keys (1 to 16) in various arrays are accessible and visible to the subject, depending on the application. For example, one application may require 2 keys labelled "YES" and "NO", combined with 4 keys forming a scale from "very good" to "very bad". An application with young children may require a single key with a smiling face.

The response units operate in two modes, a sampling mode and a question mode, pre-programmed from the microcomputer prior to being distributed to subjects for testing. In the sampling mode, a micro-processor within the response unit samples the key pressed by the respondent at rates varying between 0.25 seconds and sixty seconds. Reaction times can also be acquired and stored in this mode. A master response unit is used by the researcher during the testing session to reference criterion points in the material being tested for later synchronization of all response units by the computer.

In the question mode, response units are capable of storing as many as five hundred responses, entered through the keyboard, to questions presented either visually or aurally.

At the end of a given testing session, response units are collected from respondents (it should be noted that respondents need not be located together as a group for testing) and replaced in their storage case through which the computer extracts and records data in a period of a few minutes. At this point, the units can be immediately reprogrammed for a second testing session.

Data is stored and accrued by the central microcomputer on floppy diskettes. Data is retrievable through hard copy or colour videodisplay.

DATA DISPLAY USING PEAC

The PEAC must be connected to a videotape recorder and monitor. Data analysis begins with compilation and editing to identify and eliminate questionable or invalid data. At this point, data analysis in the desired form is displayed.

Examples of analysis display formats:

1. Respondents at various grade levels (3, 4 and 5) have been asked to monitor whether or not they understand the information being presented in a program pilot designed to convey concepts taught at the fourth grade level. The PEAC will produce comprehension profiles of the proportion of each grade who indicate understanding of the content of each segment. The producer or researcher operating the PEAC will be able to observe a colour graphic display of the points in the program where comprehension was low. Similar profiles indicating levels or enjoyment may be used in the final editing process or to determine optimal content for future programming directed at the same target. Alternatively, it may be used to redesign the program for a different group.

2. As the videotape program is viewed on one monitor, the PEAC produces moment-to-moment cumulative responses to the program on the monitored dimension as a series of sliding colour bar graphs. These can be broken down for alternate demographic comparisons. In this way, the appeal or the educational effectiveness of the program may be assessed for various potential audiences, assisting in the precise targeting of the material.

3. Deaf subjects indicate, as they view a captioned program, when they have completed reading each caption. During data analysis, as the videotape is played, the PEAC produces a graph of time to respond versus proportion of respondents on a second video monitor for each caption. The production staff have a clear indication of the most appropriate length of time for a caption to appear on the screen. The PEAC can be applied to assessing the level of comprehension of print in any program.

4. The Mondrian analysis employs colour-coding to enable the complete visual analysis of a 60-minute program in one minute. Colours are assigned to the response categories

on the scale employed in the evaluation. The PEAC divides the video screen into a number of cells corresponding to the number of subjects and presents, in sequence, the colours in each cell corresponding to the sequence of response categories chosen, at an accelerated rate. Consider the case in which comprehension level was the dimension with "white" assigned to "appropriate" and "red" to "too complex". In viewing the Mondrian, squares appear as white on the video screen for subjects for whom the content was "appropriate" throughout the program. Numbers of subjects who periodically became "lost" appear as flashes of red at the particular points in the program sequence at which this happens. This 'eyeballing' technique using colour-coding converts large amounts of data into meaningful form minutes after data collection.

CONCLUSION

The above represents four applications of the PEAC as a research tool in the formative and summative evaluation of instructional television. The strength of this instrument as a research tool lies in its ability to collect data as the viewer watches the program and to relate this data to specific program content in meaningful visual form during data analysis. Thus, we have progressed from evaluating whether or not a specific instructional program 'works' to efficiently and inexpensively evaluating at which content points it does or does not 'work' for particular target groups.

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IMAGE PRESENTATION: SOME SEMIOLOGICAL ISSUES

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ABSTRACT

The study of television as a medium of communication and instruction can be approached in semiological terms, that is, as a process which constructs and utilizes signs. Semiology is concerned with the study of signs and sign-systems in all their various manifestations, e.g. formal languages, pictorial images, gestures and all the various forms of non-verbal communication. As a discipline, the boundaries of semiology include the study of the material forms through which communications are expressed (signifiers), and the concepts to which they refer (signifieds). But it is the relationship between these two factors, defined by Saussure (see Culler, 1976) as 'the sign', which provides the main focus of psychological interest. It is at this point of cognitive fusion between signifier and signified that 'meaning' exists. It is also at this juncture that idiosyncratic interpretations can be formed on the basis of connotation.

In terms of TV programme construction, the presentation of pictorial images may appear, at surface level, as being denoted, that is, as messages bearing immediate, uncoded relationships, and yet, the treatment by which they express (signify) may be heavily connoted. Expression is never an entirely free agent; it is shaped and modified by the media through which it finds its outlet. Moreover, it is subject to the influence of conventions or styles which appear at particular moments of history. In this paper, attention is directed towards a consideration of the semiological factors which surround message presentation, with particular reference to pictorial images.

Attention is also directed towards an appreciation of skill and communication theory for the purpose of providing an understanding of the way in which 'cues' and 'markers' act as 'signposts' for message interpretation, thereby delimiting routes of connotation.

THE ESTABLISHMENT OF CODES

The establishment of codes, which is the main concern of semiology, can be considered in terms of three factors: (i) the conveying system (media); (ii) the content of the conveyed system; and (iii) the conventional correlation between (i) and (ii), technically known as the sign. As Eco (1977) pointed out, "Every time there is a correlation of this kind, recognized by a human society there is a sign... This assumption entails some consequences: (a) a sign is not a physical entity, the physical entity being at most the concrete occurrence of the expressive pertinent element; (b) a sign is not a fixed semiotic entity, but rather the meeting ground for independent elements, coming from two different systems of two different planes, and meeting on the basis of a coding correlation... Properly speaking, these are not signs, but only sign functions. A sign-function is realized when two functives (expression and content) enter into a mutual correlation".

This interpretation by Eco places 'the sign' in the province of psychology, that is, as a manifestation of cognition. The mutual correlation of which he speaks, can be none other than a psychologically invested relationship. But once established in the context of society, the sign serves a semiotic function; it becomes a code. However, because the sign emerges from a correlative act of cognition, it is subject to idiosyncratic constructions which can take many connotative directions.

DENOTATION AND CONNOTATION

The sign stands between and embraces both signifier (expression) and signified (content), it is a psychological entity without fixed observable properties, its ontogenesis is a process of construction and reconstruction, through perceptions and conceptions. It is because the sign is a mental construct with the potential for forming new relationships within an individual's cognitive framework that possibilities exist for the formation of connotation. Connotation can generate further connotation, but its existence always depends, in the first instance, upon denotation. Denotation, according to Barthes (1968), is a first-order system; whereas, connotation rests upon the establishment of a code which brings with it the possibilities of imaginative reconstructions.

The following illustration shows how 'the sign', originally denoted, shifts to form the expression (signifier) under connotation:

(i) Denotation, a first-order system

Expression	⟵	Relationship	⟶	Content
(signifier/ media)		sign (the cognitive correlation between expression and content		signified/ concepts

(ii) Connotation, a second-order system

Expression	⟵	Relationship	⟶	Content
the sign, adopted from denotation and employed as signifier		a further sign developed on the basis of correlation between a denoted sign and a new content		signified/ concepts

PARADOX OF PICTORIAL IMAGES

It is observed that connotation proceeds upon the basis of an established denotation which has been 'set-up' without recourse to an existing code. However, the existence of these two levels, one with a code (connotation) and the other without (denotation), can be a source of misinterpretation, leading to the paradox of pictorial images being received as denoted, when, in fact, they may be connoted. This arises from the fact that pictorial images, being analogical, appear to be natural and uncoded; yet, it is this apparent, surface-level objectivity, which renders them as potential sources of deception. The prestige of denotation is accorded to pictorial images because they appear uncoded, but they may conceal treatment effects which can be considered as forms of coding, e.g. lighting effects, camera angles, focusing, editing, pose, object inclusion. As Barthes (1977) wrote, "Since every sign supposes a code, it is this code (of connotation) that one should try to establish. The photographic paradox can then be seen as the co-existence of two messages, the one without a code (the photographic analogue), the other with a code (the 'art' or the treatment....of the photograph); structurally the paradox is clearly not the collusion of a denoted message and a connoted message, it is that here the connoted (or coded) message develops on the basis of a message without a code. This structural paradox coincides with an ethical paradox: when one wants to be neutral, objective, one strives to copy reality meticulously, as though the analogical were a factor of resistance against the investment of values".

PRESENTATION STYLES

The mode of presentation of programmes, their style, or in semiological terms, their rhetoric, can be seen to be subject to two major influences: (i) the media, with their physical constraints; (ii) stereotypes, which form ready made vehicles of expression. Examples of stereotypes in image presentation can be found in the various cinema 'genres'.

Style was seen by Malraux (1974) in positive terms; he regarded style as being a form of signification which imposes meaning on visual experience. Furthermore, he saw style as providing a basis for transmutation. He wrote, "Once we realize how all-important is the signification of styles, we understand why every artist of genius becomes a transformer of the meaning of the world which he masters by reducing it to forms he has selected or invented, just as the philosopher reduces it to concepts and the physicist to laws. And he attains this mastery not through the visual experience of the world itself, but by victory over one of the forms of an immediate predecessor that he has taken over and transmuted". Malraux was writing, of course, about the plastic and pictorial arts, but his message is equally applicable to other forms of media.

Now we are in a position to see that neutrality of expression is hardly ever likely to be realized. The media of expression with their own constraints, and the milieu in which programmes are constructed, both combine to produce styles which are connoted, that is, relying on primary codes for their understanding; thus they serve a semiotic function. As Gombrich (1962) pointed out, we succeed in understanding a given technical solution as the representation of a natural experience because there has been formed in us a codified system of expectations which allow us to enter into the semantic world of the artist. An iconic solution is not conventional when it is proposed, but it becomes so step-by-step, the more the addressee becomes acquainted.

SELECTION RESTRICTERS, MARKERS AND CUES

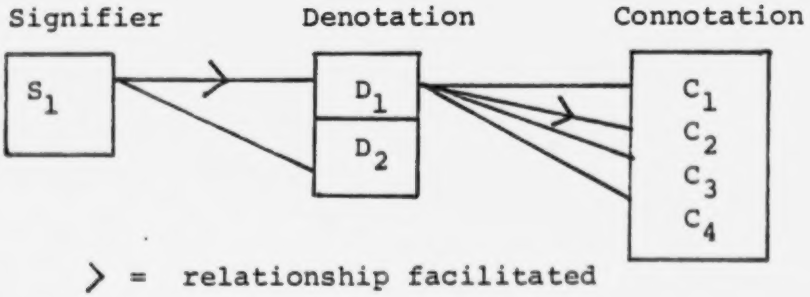
Styles can be interpreted as codidied forms of representation, which by the act of coding, allows for connotation to develop. And, as discussed earlier, pictorial umages carry the potential for connotation on a number of independent dimensions, e.g. treatment effects, non-verbal attributes.

From an instructional standpoint, it is apparent that messages, particularly those composed of pictorial images, which carry a range of possible connotations within a single field of vision, may require markers whose aim is to restrict connotation to defined fields or associations. The process can be considered in terms of guidance in which verbal prompts or treatment effects facilitate the pathways envisaged by the programme presenter.

At this point we may note the connection with guided learning as developed on the basis of skill theory, in particular the emphasis which that theory places upon curs at decision points. Both skill theory and learning which takes place on the basis of 'moving' images are characterized by spatial/temporal factors.

Furthermore, it would appear to be instructive to enlist MacKay's (1969) theorizing on human communication as additional support for the concept of facilitation in learning. MacKay discussed communication in terms of analogy with lever gettings which select appropriate pathways in the receiver's repertoire of possible response states. The implication here is that the sender (programme maker) is familiar with the response style(s) of the receiver(s) and that he can select appropriately.

An illustration follows to emphasize, in an elementary way, the concept of pathways beginning from a single signifier.


Signifier
Denotation
Connotation
S1
D1
D2
C1
C2
C3
C4
> = relationship facilitated

In practice, however, the pathways could be extremely complex. Multi-signifiers may express one denotation, and, conversely, a single signifier may express multi-denotations. The same condition could apply to the relationship between denotation and connotation. The facilitation of pathways through desired routes of denotation and connotation, whether by verbal markers or treatment effects, can be considered, in information theory terms, as information reducers.

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THE UTILITY OF EXPERIMENTAL RESEARCH IN VIDEO-TAPED INSTRUCTION: A CONFERENCE OVERVIEW

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DIFFERENT PERSPECTIVES

In trying to sum up the conference briefly, I feel very much like a beer-drinker at a wine-tasters' convention. As I explained to Dr. Sullivan when he asked me do do this session, I have in the past been critical of the use of the laboratory-controlled experimental research method in the field of educational television (see, for instance, Bates and Gallagher, 1976). Indeed, in our work at the Open University, we have deliberately chosen to use other methods. Now we all know, as a result of one of the research reports, what 'cognitive dissonance' is, so I am sure you will take into account my earlier decision not to use this research method, when considering the comments I am about to make on the research reported at this conference!

Nevertheless, I do think it is worthwhile pointing out to those attending the conference who are not researchers that the experimental research method is only one of a number of possible research strategies available for investigating the effectiveness of educational television. Indeed, organisations more concerned with broadcasting, as distinct from video-taped instruction - organisations such as Children's Television Workshop, Ontario Educational Communications Authority, and the Open University - have all tended to avoid strict, laboratory-controlled methodologies, although to be fair, researchers in even these organisations probably share many of the basic premises underlying the experimental research method.

I was interested therefore to see that quite a high proportion of the papers presented at this conference were not in fact accounts of experimental research, in the purest sense. Not only though were these papers of value in themselves, but they did in fact raise issues which appeared to me to be of direct relevance to the utility and validity of the experimental research method - as I hope to show.

THE NEED FOR A THEORETICAL PERSPECTIVE

But first, what about those papers which *did* report experimental studies?

What struck me about some of these papers was the lack of an overall theoretical - as distinct from a methodological - perspecitve. Experiments in this field are still severely handicapped by the lack of an adequate theoretical framework for instructional media. For instance, what overall *theoretical* perspective was guiding the experiments of Dr. Sullivan's group at Memorial Universtiy, or Dr. Sakamoto's experiments in Japan? Each had some individual hypotheses or assumptions that were being tested, but these did not seem to be part of a broader, *explicit* theoretical framework about how students use and learn from media.

I think it was Kurt Lewin who said that there is nothing as practical as a good theory. Any experiment on the effectiveness or otherwise of video-taped instruction should be influenced by an explicit statement of the basic theoretical position being taken. For instance, I would like to have known what expectations there were about how students will perceive, learn from and remember video-tape instruction, what the relationship of video-tape instruction was with the rest of the learners' environment, how learners were expected to integrate their video-taped instruction with the rest of their learning, what production variables were considered to be important, what instructional strategies (active learning, simplicity of messages, etc.) were considered more likely to be more effective, and why, and so on.

It is this theoretical framework which provides the source of hypotheses to be tested in an experiment. But there is no apparent theoretical framework merely behind the decision to compare one method of presentation with another. There is of course always some underlying set of assumptions which decides which variables are likely to be more important than others - but these assumptions were rarely spelt out in the reports.

Therefore I was particularly interested in the papers by Olle Findahl and Rodney Dennis. Both these pieces of research began from a pre-determined theoretical stand-point. In Findahl's study, the experiments were concerned from the outset to examine the importance of a contextual framework for understanding news items; in the Sesame Street research, it was a pre-determined theory of how young children learn which guided the whole of the experimental design.

I fear that psychologists in particular often fail to consider the history of science. Over time, theories have been built up as a result of careful observation, and only comparatively late in the science is the theory rich enough to produce an adequate framework for controlled experimentation. Too often in the social sciences we try to leap straight into the experimental stage, without building up a theory based on careful observation of the phenomena which interest us. To paraphrase McLuhan, the method becomes the message.

For this reason, I was glad that a place was found in the conference programme for Dr. Jamieson's account of semiology. This is one theoretical position which might legitimately form the base for much experimental work in this area, - even though I found it in practice difficult to relate to the experimental work reported.

THE TREATMENT OF VARIABLES

One of the problems that stems from the lack of a clear theoretical perspective is the difficulty in knowing which variables need to be controlled or taken into consideration when disigning an experiment, and interpreting results. Experimental designs typically isolate one variable - such as a presentation factor - and then, through randomisation of subjects between experimental and control groups, assume that all other important variables, such as unknown but potentially influential personality differences, are neutralised, by being spread evenly between the two groups. This has always seemed to me to be a very optimistic assumption. A strong theoretical position on the other hand would suggest those variables which do need to be controlled or examined closely. For instance, in the Memorial University experiments, to what extent was the difference in performance of the presenter - on the one hand in the familiar setting of a lecture room with a live audience, and on the other, in the unfamiliar setting of a studio with a professional television crew - a factor in influencing the results? We can only surmise on this after the experiment. A strong theory however should enable us to predict in advance the likely effect, not only of this factor, but of many others.

Several of the studies - Jon Baggaley's, David Mitchell's, the Memorial University experiments - produced unexpected, if sometimes consistent, results. This of course is the value of an experimental approach, particularly if the variables are will controlled. However, without a theory, one has to make post-hoc explanations for the findings, and such explanations have no more reliability than an original hypothesis which has not been tested. I was certainly not satisfied in the examples quoted that there were not better alternative explanations for the 'unexpected' results.

Without a sound theoretical base, though, it is difficult to anticipate those variables or factors which are likely to influence the results. Therefore an essential feature of experimental research - the elimination of all alternative explanations - is almost impossible to achieve unless there is a 'rich' theoretical framework in the first place.

Dr. Nienhouse's presentation in particular drew attention to one variable which I believe is never given enough consideration in experimental design, and that is the quality of the production. Nienhouse's programme extracts emphasised the importance of imagination and humour in programme design - but how does one measure or control 'quality' in production, especially across different media? Very rarely does one get the chance - (which fortunately we did with the Memorial University production) - to see or hear about the quality and format of the programmes themselves. Often experimental research reports fail even to mention this aspect. Yet surely this is a crucial factor which must have some influence on research results, especially in cross-media comparisons. Schramm (1977) for instance has reported with regard to performance scores that variations within media are far greater than variations between media. Quality (and also relevance) are surely crucial variables, which must be taken into consideration.

MEDIA ARE NOT FUNCTIONALLY EQUIVALENT

Dr. Nienhouse's presentation, as well as demonstrating the importance of what broadcasters would call production values - humour, imagination, that ephemeral characteristic, 'quality' - also demonstrated very clearly that media are not functionally equivalent. In other words, some teaching fuctions, in certain contexts, can be better achieved through some media rather than others. Nienhouse's tapes showed that the techniques available through television can radically change the instructional approach. He was not trying to replicate a lecture situation, but to create an entirely different learning environment, one where motivation was more important than the learning of specific facts or concepts. These facts and concepts could be obtained through the textbooks more efficiently - but not the motivation.

Similarly, Dr. Laaser referred to the different functions ascribed to different media at the Fernuniversität - the print material being used for presentation and analysis of facts and concepts, the television programmes for applying these concepts to real-world situations.

On the other hand, the Memorial University experiments attempted exactly to replicate the lecture approach on the television screen. Thus the unique presentational aspects of television were deliberately avoided, in the name, I presume, of controlling variables. However, the Memorial University experiments do not compare the relative effectiveness of television and lectures, as 'media' of instruction. They merely compare different ways of delivering the same instructional approach. Television though is more than just a delivery system. Eliminating differences in the way media can present instruction in order to control 'variables' is like cutting off two legs of a horse before seeing if it can run faster than a man.

THE PURPOSE OF EXPERIMENTAL RESEARCH

This brings me to the fundamental question about the prupose behind experimental research in video-taped instruction. What is the long-term goal behind such research? It seemed to me that what set the different studies apart were not so much basic differences in research methodology, but differences in the way the different pieces of research were intended to be used.

I don't think the Memorial University research was intended *for making decisions about whether or not to use video-taped* instruction - that would have required a completely different research strategy. An analysis of costs, the qualitative reactions of students and staff, and a design which allowed the unique presentational characteristics of the alternative media available would have been needed to be taken into consideration. The Memorial University experiments were surely more of an intellectual exercise, a search for more universal truths, knowledge for its own sake.

On the other hand, the studies by Findahl, Baggaley and Coldevin, while clearly concerned with establishing generalisable principles, did seem to me more concerned with influencing practical decisions about production format and the structuring of programme material. Pat Porter's research began from a different perspective. She was more concerned with a teaching problem - could television help with the teaching of slow-learning children? Here, the problem was more important than the theory or the methodology. She clearly understood the need for a careful scientific approach, but it was more important that the programmes were tested in the actual context in which they would be used, even if the strict control of variables which the laboratory-controlled experiment demands could not thus be achieved. Finally, the research reported by OECA and CTW was much more concerned with the educational effectiveness of a particular programme, or series of programmes, than with establishing general principles which would stand up in a wide variety of contexts.

One can judge the value of the methods used - and their validity - only in the light of their known objectives or purposes. I found the conference particularly valuable for reinforcing the point that there is no one over-riding research method which is superior to any other. The 'best' reserach method depends very much on what one intends to do with the results.

THE VALUE OF THE SCIENTIFIC APPROACH

Despite the wide range of differences between the studies, in the extent to which they matched or departed from the 'pure' model of laboratory-controlled experimental research, I found the conference particularly worthwhile, because it did serve to reinforce the value of a scientific approach to the problem of assissing educational television. The experimental research mentod sets the standards which the rest of us have to match.

Each of us will take away something different from the conference, but I found the sessions by Olle Findahl, Jon Baggaley, Pat Porter, and the OECA, of particular relevance to my own problem. I would also hope it has helped make practitioners more aware of the need to test and validate their procedures in the light of student performance. For instance, it would have been easier for me to argue the importance of taking production creativity and imagination into consideration in research design, if Dr. Nienhouse had been able to produce empirical evidence of the benefits it had brought to his students!

I would like to thank then Dr. Sullivan and his team on a number of counts. I have just mentioned the professional stimulation and increased awareness of the value of well-conducted empirical research, that the conference has provided. This of course is the result of a shrewd choice in speakers. Secondly, I was warned, before I came, about Newfoundland hospitaltiy. I thought people were exaggerating. They were not. In all honesty, I cannot remember a professioanl visit on which I have been so well looked after - and from talking to other participants, I was not suprised to find that this was the general experience. Finally, though there are not many of us carrying out research in educational television, we are scattered all around the world. I found it particularly rewarding to meet, sometimes for the first time, colleagues whose work I have admired, but have never had the chance to discuss. I have made some contacts which will, I know, continue fruitfully for many years.

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CONFERENCE OVERVIEW
BY PRACTITIONERS' PANEL

Charlotte O'Dea (Avalon Cablevision, St. John's)
Craig McNamara (ETV, Memorial University)
Charles Mardel (CBC, Corner Brook)

CONFERENCE OVERVIEW BY 'PRACTITIONERS' PANEL

Rapporteuse: Joan Sharpe, Memorial University

The final session of the Conference discussed the practical value of the Conference papers from the point of view of the TV producer. The discussion was led by a panel of practitioners*, each of whom felt that the Conference had been useful. Though it was observed that most of the presentations were made in a manner that non-research persons could readily understand, it was also noted that the Conference in general had been orientated more towards the statistical analysis of audience reactions than to the practical aspects of production. In general it was felt that even though few practical rules for TV presentation had emerged from the Conference, it was encouraging that research is now being undertaken in this field. As examples of the types of research that are most relevant to practical production problems the speakers mentioned the CTW, Liverpool and OECA work, valuable for their emphases on presentation variables, attention-getting and retention processes.

The panellists offered their suggestions for the design of future Conferences. One called for shorter presentations and more time for in-depth discussion. Another felt that restricting the range of papers in future to specific topics would be beneficial. Research with the most practical value should be presented together in one day. The need to keep the Conference small while choosing speakers carefully was also stressed.

A wide range of subjects was suggested for the organizers of future Conferences to bear in mind when selecting speakers. Interest was expressed in the in-home electronic systems of the future and their impact on the educational system, also in research related to community programming, including such aspects as viewer loyalty, effects of programme quality on viewers and the effects of specific production techniques. From the educational TV viewpoint it was felt that formative methods of improving course instruction and methodology were of particular importance, and should continue to be examined by the Memorial University's series of TV Conferences henceforward.

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* Thanks are due to Charlotte O'Dea (Avalon Cablevision, St. John's), Craig McNamara (ETV, Memorial University of Newfoundland) and Charles Mardel (CBC, Corner Brook) for their leading role in this discussion.

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Published by: Memorial University of Newfoundland
St. John's, Newfoundland
Canada A1B 3X8

1981